

```
[> restart;
```

```
[> read "ODE3solve.mpl":
```

Package "Solving third-order holonomic differential equations", Maple 16
Copyright 2017, Mouafo Wouodjie Merlin, University of Kassel
Package "Hypergeometric Summation", Maple V - Maple 17
Copyright 1998-2013, Wolfram Koepf, University of Kassel

(1)

```
[> ##### ILLUSTRATION OF THEOREM 2.3 #####
```

[In the section 2.1 called "Types of Transformations" we have our Maple implementations which give us the coefficients of the resulting operator M coming from the given one L after one of the following transformations: change of variables, exp-product and gauge transformation.

[Our given operator L

```
[> a0:=x-> a_0(x);
```

$$a0 := x \mapsto a_0(x) \quad (2)$$

```
[> a1:=x-> a_1(x);
```

$$a1 := x \mapsto a_1(x) \quad (3)$$

```
[> a2:=x-> a_2(x);
```

$$a2 := x \mapsto a_2(x) \quad (4)$$

```
[> a3:=x-> a_3(x);
```

$$a3 := x \mapsto a_3(x) \quad (5)$$

```
[> L:= a3(x)*Dx^3+a2(x)*Dx^2+a1(x)*Dx+a0(x);
```

$$L := a_3(x) Dx^3 + a_2(x) Dx^2 + a_1(x) Dx + a_0(x) \quad (6)$$

```
[>
```

[Our resulting operator M coming from L

```
[> M:= Dx^3+b2(x)*Dx^2+b1(x)*Dx+b0(x);
```

$$M := Dx^3 + b2(x) Dx^2 + b1(x) Dx + b0(x) \quad (7)$$

[If the operator M came from L after a change of variable transformation with parameter f:

```
[> g:=x-> f(x);
```

$$g := x \mapsto f(x) \quad (8)$$

```
[> M:= ChangeOfVariablesGeneral(L,g(x));
```

```
[> b0(x):= coeff(M,Dx,0);
```

$$b0(x) := \frac{a_0(f(x)) \left(\frac{d}{dx} f(x) \right)^3}{a_3(f(x))} \quad (9)$$

```
[> b1(x):= coeff(M,Dx,1);
```

(10)

$$b1(x) := \frac{1}{a_3(f(x)) \left(\frac{d}{dx} f(x) \right)^2} \left(a_1(f(x)) \left(\frac{d}{dx} f(x) \right)^4 - a_2(f(x)) \left(\frac{d^2}{dx^2} f(x) \right) \right. \\ \left. \left(\frac{d}{dx} f(x) \right)^2 - \left(\frac{d^3}{dx^3} f(x) \right) a_3(f(x)) \left(\frac{d}{dx} f(x) \right) + 3 \left(\frac{d^2}{dx^2} f(x) \right) \right. \\ \left. \left. f(x) \right)^2 a_3(f(x)) \right) \quad (10)$$

$$\begin{aligned} &> \mathbf{b2(x) := coeff(M,Dx,2);} \\ &b2(x) := \frac{a_2(f(x)) \left(\frac{d}{dx} f(x) \right)^2 - 3 \left(\frac{d^2}{dx^2} f(x) \right) a_3(f(x))}{a_3(f(x)) \left(\frac{d}{dx} f(x) \right)} \quad (11) \end{aligned}$$

[If the operator M came from L after an exp-product transformation with parameter r:

$$\begin{aligned} &> \mathbf{rr:=x-> r(x);} \\ &rr := x \mapsto r(x) \quad (12) \end{aligned}$$

$$\begin{aligned} &> \mathbf{M:= ExpProductGeneral(L,rr(x));} \\ &> \mathbf{b0(x) := coeff(M,Dx,0);} \\ &b0(x) := -\frac{1}{a_3(x)} \left(r(x)^3 a_3(x) - r(x)^2 a_2(x) - 3 r(x) \left(\frac{d}{dx} r(x) \right) a_3(x) + \left(\frac{d^2}{dx^2} r(x) \right) a_3(x) \right. \\ &\quad \left. + r(x) a_1(x) + \left(\frac{d}{dx} r(x) \right) a_2(x) - a_0(x) \right) \quad (13) \end{aligned}$$

$$\begin{aligned} &> \mathbf{b1(x) := coeff(M,Dx,1);} \\ &b1(x) := \frac{3 r(x)^2 a_3(x) - 2 r(x) a_2(x) - 3 \left(\frac{d}{dx} r(x) \right) a_3(x) + a_1(x)}{a_3(x)} \quad (14) \end{aligned}$$

$$\begin{aligned} &> \mathbf{b2(x) := coeff(M,Dx,2);} \\ &b2(x) := -\frac{3 r(x) a_3(x) - a_2(x)}{a_3(x)} \quad (15) \end{aligned}$$

[If the operator M came from L after a gauge transformation with parameters r0, r1 and r2:

$$\begin{aligned} &> \mathbf{r0:=x-> r_0(x);} \\ &r0 := x \mapsto r_0(x) \quad (16) \end{aligned}$$

$$\begin{aligned} &> \mathbf{r1:=x-> r_1(x);} \\ &r1 := x \mapsto r_1(x) \quad (17) \end{aligned}$$

$$\begin{aligned} &> \mathbf{r2:=x-> r_2(x);} \\ &r2 := x \mapsto r_2(x) \quad (18) \end{aligned}$$

$$\begin{aligned} &> \mathbf{M:= GaugeTransfGeneral(L,r0(x),r1(x),r2(x));} \\ &> \mathbf{b0(x) := coeff(M,Dx,0);} \end{aligned}$$

$$\begin{aligned}
b0(x) := & - \left(-2 \left(\frac{d}{dx} a_{-1}(x) \right)^2 r_{-2}(x)^3 a_{-0}(x) - 3 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^3 a_{-0}(x)^2 - 2 \left(\frac{d}{dx} a_{-0}(x) \right)^2 r_{-2}(x)^3 a_{-2}(x) \right. \\
& - r_{-0}(x)^3 a_{-3}(x)^2 a_{-0}(x) - 6 \left(\frac{d}{dx} r_{-1}(x) \right)^3 a_{-3}(x)^2 a_{-0}(x) \\
& + r_{-1}(x)^3 a_{-3}(x) a_{-0}(x)^2 + 6 \left(\frac{d}{dx} r_{-2}(x) \right)^3 a_{-3}(x) a_{-0}(x)^2 + r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-1}(x)^3 \\
& - 2 r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-2}(x)^3 - 6 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-1}(x) \right) a_{-3}(x)^2 a_{-0}(x) \\
& - r_{-0}(x)^2 r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) + r_{-0}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-1}(x) \\
& - 11 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right)^2 a_{-3}(x)^2 a_{-0}(x) \\
& + 2 r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x)^2 - r_{-0}(x) r_{-2}(x)^2 a_{-1}(x)^2 a_{-0}(x) \\
& - 2 r_{-0}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-2}(x) a_{-3}(x)^2 - 2 \left(\frac{d}{dx} r_{-1}(x) \right)^2 r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) \\
& + 6 \left(\frac{d}{dx} r_{-1}(x) \right)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-1}(x) + 3 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x)^2 \\
& - \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-1}(x)^2 a_{-0}(x) - 6 \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-2}(x) a_{-3}(x)^2 \\
& + 6 r_{-1}(x)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-0}(x)^2 \\
& - r_{-1}(x)^2 r_{-2}(x) a_{-2}(x) a_{-0}(x)^2 + r_{-1}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x)^2 \\
& + 11 r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-0}(x)^2 + r_{-1}(x) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x)^2 \\
& + 2 r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-2}(x)^2 a_{-3}(x) - 5 r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-3}(x)^2 a_{-1}(x) \\
& - 2 \left(\frac{d}{dx} r_{-2}(x) \right)^2 r_{-2}(x) a_{-2}(x) a_{-0}(x)^2 + 6 \left(\frac{d}{dx} r_{-2}(x) \right)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x)^2 \\
& + \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x)^2 + 6 \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-2}(x)^2 a_{-3}(x) \\
& - 12 \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) a_{-3}(x) a_{-0}(x)^2 \\
& \left. - 6 \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) a_{-3}(x) a_{-1}(x)^2 \right) \quad (19)
\end{aligned}$$

$$\begin{aligned}
& r_{-0}(x) \Big)^2 a_{-3}(x)^2 a_{-1}(x) + 6 r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-0}(x)^2 \\
& - 11 r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-3}(x)^2 a_{-0}(x) - 6 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big)^2 a_{-2}(x)^2 - 2 \left(\frac{d}{dx} a_{-2}(x) \right)^2 r_{-0}(x) r_{-2}(x)^2 a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-2}(x) \right)^2 \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x)^2 a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right)^2 r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-1}(x) + 2 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^3 a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-0}(x)^2 \\
& - 2 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-3}(x)^2 + 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x)^2 a_{-0}(x)^2 - 6 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-3}(x)^2 \\
& + 3 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-1}(x)^2 + 2 \left(\frac{d}{dx} a_{-1}(x) \right)^2 r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x) + 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^3 a_{-1}(x) + \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-1}(x)^3 a_{-3}(x) a_{-0}(x) + 6 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^3 a_{-3}(x) a_{-0}(x) \\
& - 7 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-3}(x)^2 + 2 \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big)^2 r_{-1}(x) r_{-2}(x)^2 a_{-3}(x) + 2 \left(\frac{d}{dx} a_{-0}(x) \right)^2 \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-3}(x) \\
& - \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x)^2 r_{-1}(x) a_{-3}(x)^2 - 3 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-3}(x)^2 - 2 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right)^2 r_{-1}(x) a_{-3}(x)^2 - 6 \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) \left(\frac{d}{dx} r_{-1}(x) \right)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 - \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x)^3 a_{-3}(x) a_{-1}(x) \\
& + 2 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 - \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-1}(x) r_{-2}(x)^2 a_{-1}(x)^2 - 6 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^3 a_{-3}(x) a_{-1}(x)
\end{aligned}$$

[illegible]

$$\begin{aligned}
& a_0(x) \Big) r_0(x) r_2(x)^2 a_3(x) a_0(x) + 5 \left(\frac{d}{dx} a_0(x) \right) r_0(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x)^2 - \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right)^2 r_2(x) a_2(x) a_3(x) + \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) \left(\frac{d}{dx} r_1(x) \right) r_1(x)^2 a_2(x) a_3(x) - \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_1(x) r_2(x) a_2(x)^2 + 6 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big)^2 a_2(x) a_3(x) - 2 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_2(x)^2 - \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_2(x) a_1(x) \\
& - 5 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_3(x) a_0(x) + 7 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - 6 \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) a_3(x) a_1(x) + \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 r_2(x) a_2(x) a_1(x) + 2 \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) r_1(x)^2 r_2(x) a_3(x) a_0(x) - 11 \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big)^2 a_3(x) a_1(x) + 8 \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x)^2 - 2 \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_2(x) a_0(x) + 2 \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) \left(\frac{d}{dx} r_2(x) \right)^2 r_2(x) a_2(x) a_1(x) + 4 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big)^2 r_2(x) a_3(x) a_0(x) - 2 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_2(x) a_0(x) \\
& - 5 \left(\frac{d}{dx} a_0(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) - 2 \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) r_0(x) r_2(x)^2 a_3(x) - 2 \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x)^2 a_3(x) + \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2
\end{aligned}$$

$$\begin{aligned}
& + 3 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 + 3 \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \left. \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-3}(x)^2 + 6 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-3}(x)^2 + 4 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) + 6 \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \left. \right) r_{-1}(x)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \left. \right) r_{-1}(x)^2 r_{-2}(x) a_{-2}(x) a_{-0}(x) - \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-3}(x) + 11 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-0}(x) \\
& + \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) + \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x)^2 - 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 r_{-2}(x) a_{-2}(x) a_{-0}(x) - 6 \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \left. \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x)^2 - 3 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-1}(x) + 2 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \left. \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) r_{-2}(x)^2 a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) + 2 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \left. \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) - 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \left. \right) r_{-1}(x) r_{-2}(x)^2 a_{-1}(x) - 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-2}(x) \Big) r_{-2}(x)^2 a_{-1}(x) - 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x) + 3 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-0}(x) r_{-1}(x)^2 a_{-3}(x) a_{-0}(x) - 6 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big)^2 a_{-3}(x) a_{-0}(x) - 3 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) + 7 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) \left(\frac{d}{dx} r_{-1}(x) \right)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-1}(x)^2 a_{-3}(x) a_{-0}(x) - 6 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big)^2 a_{-3}(x) a_{-0}(x) - 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) \\
& + \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x) + 6 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x) - 4 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x) a_{-0}(x) + 6 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-2}(x) a_{-3}(x) \\
& + 6 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-0}(x) - 2 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-0}(x) - 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) \left(\frac{d}{dx} r_{-2}(x) \right)^2 r_{-2}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-1}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) - 2 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-1}(x) + 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) \left(\frac{d}{dx} r_{-1}(x) \right)^2 r_{-2}(x) a_{-3}(x) - 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x)^2 a_{-1}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-1}(x)
\end{aligned}$$

$$\begin{aligned}
& -2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_0(x) + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right)^2 r_2(x) a_1(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_0(x) + 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_2(x) + \left(\frac{d}{dx} a_3(x) \right) r_0(x)^2 r_1(x) a_3(x) a_0(x) + 3 \left(\frac{d}{dx} a_3(x) \right) r_0(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} a_3(x) \right) r_0(x)^2 r_2(x) a_2(x) a_0(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right)^2 \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) + 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right)^2 \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) - 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right)^2 r_2(x) a_2(x) a_0(x) - 2 \left(\frac{d}{dx} a_3(x) \right) r_1(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) - 6 \left(\frac{d}{dx} a_3(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_0(x)^2 - 2 \left(\frac{d}{dx} a_3(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_1(x)^2 + 2 \left(\frac{d}{dx} a_3(x) \right) r_1(x) \left(\frac{d}{dx} r_0(x) \right)^2 a_2(x) a_3(x) - 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_2(x) \right)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_1(x)^2 + 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right)^2 a_2(x) a_3(x) - 5 \left(\frac{d}{dx} a_3(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_1(x) a_0(x) + 7 \left(\frac{d}{dx} a_3(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right)^2 a_3(x) a_1(x) - 6 \left(\frac{d}{dx} a_3(x) \right)^2 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_0(x) + 2 \left(\frac{d}{dx} a_3(x) \right)^2 r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_1(x) + 4 \left(\frac{d}{dx} a_3(x) \right)^2 \left(\frac{d}{dx} r_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_1(x)
\end{aligned}$$

$$\begin{aligned}
& + 4 \left(\frac{d}{dx} a_3(x) \right)^2 r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_0(x) + 4 \left(\frac{d}{dx} a_3(x) \right)^2 \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_0(x) - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_0(x) + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right)^2 a_3(x) \\
& + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_2(x)^2 a_0(x) - \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_1(x) a_3(x)^3 - \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^3 \\
& + 3 \left(\frac{d^3}{dx^3} r_0(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) a_3(x)^3 + \left(\frac{d^3}{dx^3} r_0(x) \right) r_1(x)^2 a_3(x)^2 a_1(x) - 2 \left(\frac{d^3}{dx^3} r_0(x) \right) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^3 \\
& + 2 \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x)^2 a_1(x) - 2 \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^3 + \left(\frac{d^3}{dx^3} r_0(x) \right) r_2(x)^2 a_3(x) a_1(x)^2 + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x)^2 a_0(x)^2 + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x)^2 a_1(x)^2 - \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x)^2 a_2(x)^2 a_0(x) + \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x)^2 a_2(x) a_1(x)^2 - 3 \left(\frac{d^2}{dx^2} r_2(x) \right)^2 r_0(x) a_3(x)^2 a_0(x) - 3 \left(\frac{d^2}{dx^2} r_2(x) \right)^2 \left(\frac{d}{dx} r_1(x) \right) a_3(x)^2 a_0(x) + 3 \left(\frac{d^2}{dx^2} r_2(x) \right)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x)^3 r_0(x) a_3(x)^2 a_1(x) - 3 \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^3 - 4 \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x)^2 a_3(x)^2 a_0(x) - 9 \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} r_1(x) \right)^2 a_3(x)^2 a_0(x) + \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x)^2 a_2(x) a_0(x)^2 - 6 \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right)^2 a_2(x) a_3(x)^2 a_0(x) - 3 \left(\frac{d^2}{dx^2} r_1(x) \right)^2 r_2(x) a_3(x)^2 a_0(x)
\end{aligned}$$

$$\begin{aligned}
& + \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d}{dx} a_{-O}(x) \right) r_{-I}(x)^2 a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-O}(x) \left. \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d}{dx} a_{-O}(x) \right) r_{-2}(x)^2 a_{-2}(x)^2 \\
& - 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d^2}{dx^2} r_{-O}(x) \right) r_{-O}(x) a_{-3}(x)^3 - 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-O}(x) \left. \right) \left(\frac{d}{dx} r_{-I}(x) \right) a_{-3}(x)^3 + 4 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-O}(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& r_{-I}(x) \left. \right) r_{-2}(x) \left(\frac{d}{dx} r_{-O}(x) \right) a_{-2}(x)^3 - \left(\frac{d}{dx} a_{-I}(x) \right) \left(\frac{d^2}{dx^2} r_{-O}(x) \right) r_{-I}(x)^2 a_{-3}(x)^2 \\
& - 3 \left(\frac{d}{dx} a_{-I}(x) \right) \left(\frac{d^2}{dx^2} r_{-O}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x)^2 - \left(\frac{d}{dx} a_{-I}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-O}(x) \left. \right) r_{-2}(x)^2 a_{-2}(x)^2 - 3 \left(\frac{d^2}{dx^2} r_{-O}(x) \right)^2 r_{-2}(x) a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} \right. \\
& r_{-O}(x) \left. \right) r_{-O}(x)^2 a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} r_{-O}(x) \right) r_{-O}(x) r_{-2}(x) a_{-2}(x)^3 - 6 \left(\frac{d^2}{dx^2} \right. \\
& r_{-O}(x) \left. \right) r_{-O}(x) \left(\frac{d}{dx} r_{-O}(x) \right) a_{-3}(x)^3 + 3 \left(\frac{d^2}{dx^2} r_{-O}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-I}(x) \left. \right)^2 a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) r_{-I}(x) r_{-2}(x)^2 a_{-O}(x)^2 + \left(\frac{d^2}{dx^2} \right. \\
& a_{-3}(x) \left. \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-O}(x)^2 + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-O}(x) \left. \right) a_{-I}(x)^2 + \left(\frac{d^3}{dx^3} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d}{dx} r_{-O}(x) \right) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} \right. \\
& r_{-2}(x) \left. \right) \left(\frac{d^2}{dx^2} r_{-O}(x) \right) r_{-O}(x) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-O}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-I}(x) \left. \right) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} r_{-2}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-O}(x)^2 - \left(\frac{d^2}{dx^2} a_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-I}(x) \left. \right) r_{-2}(x)^3 a_{-O}(x) + \left(\frac{d^2}{dx^2} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-O}(x) \right) r_{-2}(x)^3 a_{-I}(x) - 2 \left(\frac{d^2}{dx^2} \right. \\
& a_{-2}(x) \left. \right) r_{-2}(x) \left(\frac{d}{dx} r_{-O}(x) \right)^2 a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} r_{-I}(x) \right) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-O}(x) \left. \right) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} r_{-I}(x) \right) \left(\frac{d^2}{dx^2} r_{-O}(x) \right) r_{-I}(x) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} \right. \\
& r_{-I}(x) \left. \right) \left(\frac{d^2}{dx^2} r_{-O}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} r_{-I}(x) \right) r_{-O}(x) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-0}(x) \Big) a_{-3}(x)^3 - 2 \left(\frac{d^3}{dx^3} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} \right. \\
& r_{-1}(x) \Big) r_{-1}(x)^2 a_{-3}(x)^2 a_{-0}(x) - 2 \left(\frac{d^3}{dx^3} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x)^2 a_{-0}(x) \\
& + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) r_{-2}(x)^3 a_{-0}(x) - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-2}(x)^3 a_{-2}(x) + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-2}(x)^3 a_{-1}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} \right. \\
& a_{-1}(x) \Big) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-2}(x)^3 a_{-1}(x) + \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^3 a_{-2}(x) - \left(\frac{d^2}{dx^2} \right. \\
& a_{-0}(x) \Big) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x)^2 - 2 \left(\frac{d^2}{dx^2} \right. \\
& a_{-0}(x) \Big) \left(\frac{d}{dx} r_{-1}(x) \right)^2 r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x)^2 a_{-2}(x)^2 + \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-2}(x)^3 a_{-2}(x) a_{-0}(x) + \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Big) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) a_{-3}(x)^3 + \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x)^3 - 9 \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 - 4 \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-1}(x)^2 a_{-3}(x)^2 a_{-0}(x) - 9 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x)^2 a_{-0}(x) \\
& - 5 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 - 5 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x)^2 + 5 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) + 4 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) a_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-1}(x) a_{-2}(x)^2 a_{-3}(x) - 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x)^2 a_{-3}(x) + 2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-2}(x) \Big) a_{-3}(x)^2 a_{-1}(x) + 4 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) a_{-2}(x)^2 a_{-3}(x) - 2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-1}(x) a_{-3}(x)^2 a_{-1}(x) - 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-2}(x)^2 a_{-3}(x) + 7 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) \\
& + \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x)^2 a_{-2}(x) a_{-3}(x) a_{-1}(x) - 13 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x)^2 a_{-1}(x) + 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big)^2 a_{-2}(x) a_{-3}(x) a_{-1}(x) - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x)^2 a_{-1}(x) \\
& - 2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-1}(x)^2 + 5 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) - 5 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^2 + 4 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 - 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) + 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x) a_{-3}(x)^2 a_{-1}(x) + 4 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^2 a_{-0}(x) \\
& + 7 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x)^2 + 6 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-1}(x) a_{-3}(x)^2 a_{-0}(x) + 9 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-2}(x) \Big) a_{-3}(x)^2 a_{-0}(x) - 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-1}(x)^2 a_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) + \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x)^2 a_{-3}(x) - 4 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-1}(x) \\
& - 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x)^2 a_{-3}(x) - 9 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 a_{-1}(x) - \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-1}(x) a_{-0}(x) - 13 \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 + 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) a_{-3}(x)^2 - 4 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-3}(x)^2 - 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) + 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) a_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) a_{-2}(x) a_{-3}(x)^2 - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) a_{-3}(x)^2 a_{-1}(x) \\
& - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-1}(x) + 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) - 13 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) + 4 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-1}(x) - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-1}(x) \Big) r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) + 9 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 a_{-1}(x) - 4 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x)^2 + 7 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-0}(x) - 6 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-0}(x)^2 + 9 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 a_{-0}(x) + \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 a_{-1}(x) \\
& - 4 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x)^2 - \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 - 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 - \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) \\
& + \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^2 + 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 + \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-1}(x) a_{-3}(x)^2 + 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-3}(x)^2 + \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-1}(x) - 3 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 + 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-2}(x)^2 + 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) a_{-2}(x)^2 + \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x)^2 a_{-3}(x) a_{-1}(x) \\
& + 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-1}(x) - 2 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-1}(x) \Bigg) r_{-1}(x) a_{-3}(x)^2 a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) a_{-3}(x)^2 a_{-0}(x) - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Bigg) a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 \\
& + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) r_{-0}(x) r_{-1}(x) a_{-3}(x)^2 - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) a_{-3}(x)^2 \\
& - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-1}(x) - 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Bigg) a_{-3}(x)^2 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) + \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Bigg) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Bigg) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) \\
& - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-0}(x) r_{-1}(x) a_{-2}(x) a_{-3}(x)^2 - 2 \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x)^2 a_{-3}(x) - 2 \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Bigg) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 a_{-1}(x) - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Bigg) r_{-1}(x) a_{-2}(x) a_{-3}(x)^2 - 2 \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-2}(x) \Big) a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x)^2 a_{-3}(x) \\
& - 3 \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^2 a_{-1}(x) + 3 \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Big) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-1}(x) + \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& + 2 \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x)^2 - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-1}(x) \\
& + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-1}(x) r_{-2}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) + 2 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big)^2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-1}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-1}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-2}(x)^2 a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-2}(x)^2 a_{-1}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) r_{-2}(x)^2 a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x)^2 a_{-1}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& a_0(x) \Big) r_2(x)^2 a_2(x) - \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_1(x)^2 a_3(x) a_0(x) \\
& - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x) a_0(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x)^2 a_1(x) a_0(x) \\
& - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_1(x)^2 a_1(x) a_0(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x) \\
& \left(\frac{d}{dx} r_0(x) \right) a_2(x)^2 - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x)^2 a_2(x) - \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x)^2 a_3(x) a_0(x) \\
& + \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) \\
& + \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_3(x) + \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_3(x) \\
& - \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_1(x) r_2(x) a_3(x)^2 - \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x)^2 \\
& + \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x)^2 a_2(x) a_3(x) - \left(\frac{d^2}{dx^2} a_1(x) \right) r_0(x) r_2(x)^2 a_3(x) a_0(x) \\
& + \left(\frac{d^2}{dx^2} a_1(x) \right) r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - 2 \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_3(x) a_0(x) \\
& + 2 \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 + \left(\frac{d^2}{dx^2} a_1(x) \right) r_1(x)^2 r_2(x) a_3(x) a_0(x) \\
& - \left(\frac{d^2}{dx^2} a_1(x) \right) r_1(x) r_2(x)^2 a_2(x) a_0(x) + 2 \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d}{dx} r_2(x) \right)^2 r_2(x) a_3(x) a_0(x) \\
& - \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_2(x) a_0(x) - \left(\frac{d^2}{dx^2} a_1(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) \\
& - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_2(x)^2 a_2(x) - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_2(x)^2 a_2(x) \\
& - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_2(x)^2 a_2(x) - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_2(x)^2 a_2(x)
\end{aligned}$$

$$\begin{aligned}
& a_3(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_2(x) + \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& a_3(x) \left. \right) r_1(x) r_2(x)^2 a_1(x) + \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \left. \right) r_2(x)^2 a_1(x) - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) r_2(x) a_3(x)^2 \\
& - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x)^2 + \left(\frac{d^2}{dx^2} \right. \\
& a_0(x) \left. \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x)^2 a_3(x) a_1(x) + \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& a_2(x) \left. \right) r_0(x) r_2(x)^2 a_3(x) + \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \left. \right) r_2(x)^2 a_3(x) + \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_1(x) r_2(x) a_3(x)^2 \\
& + \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& a_0(x) \left. \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x)^2 a_2(x) a_3(x) - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& a_1(x) \left. \right) r_1(x) r_2(x)^2 a_3(x) - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \left. \right) r_2(x)^2 a_3(x) - 3 \left(\frac{d^2}{dx^2} a_0(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x)^2 \\
& + 2 \left(\frac{d^2}{dx^2} a_0(x) \right) r_0(x) r_2(x)^2 a_3(x) a_1(x) + 3 \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \left. \right) r_2(x)^2 a_3(x) a_1(x) - \left(\frac{d^2}{dx^2} a_0(x) \right) r_1(x)^2 r_2(x) a_3(x) a_1(x) \\
& - 4 \left(\frac{d^2}{dx^2} r_1(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) a_0(x) + 2 \left(\frac{d^2}{dx^2} \right. \\
& r_1(x) \left. \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_1(x) a_0(x) + 5 \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \left. \right) a_2(x) a_3(x) a_1(x) + 2 \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_0(x) \left. \right) r_1(x) r_2(x) a_2(x) a_3(x) + 4 \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \left. \right) r_2(x) a_2(x) a_3(x) - 2 \left(\frac{d^2}{dx^2} r_0(x) \right) r_0(x) r_2(x) a_2(x) a_3(x) a_1(x)
\end{aligned}$$

$$\begin{aligned}
& -2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-1}(x) + 4 \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \left. \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x) a_{-1}(x) + 5 \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \left. \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 7 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-3}(x) - 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \\
& - 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x) a_{-3}(x) + 4 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \left. \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) + 6 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \left. \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-1}(x) + \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \left. \right) r_{-0}(x) r_{-1}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 4 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) a_{-0}(x) \\
& + \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \left. \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 4 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \left. \right) r_{-2}(x) a_{-3}(x) a_{-1}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-3}(x) a_{-1}(x) - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-3}(x) a_{-1}(x) + 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \left. \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) + 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned} & r_{-0}(x) \Big) a_{-2}(x) a_{-3}(x) - 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \\ & - 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} \right. \\ & a_{-2}(x) \Big) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) - \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-0}(x) \Big) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-1}(x) - 2 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\ & a_{-0}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) - 4 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\ & r_{-2}(x) \Big) r_{-2}(x) a_{-2}(x) a_{-3}(x) - 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) \\ & - 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} \right. \\ & a_{-3}(x) \Big) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-1}(x) a_{-2}(x) a_{-3}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-0}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-0}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) - \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\ & r_{-1}(x) \Big) r_{-1}(x) a_{-2}(x) a_{-3}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\ & r_{-2}(x) \Big) a_{-2}(x) a_{-3}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\ & r_{-1}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-1}(x) + 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\ & r_{-2}(x) \Big) a_{-3}(x) a_{-1}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-1}(x) \\ & + 5 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 3 \left(\frac{d}{dx} \right. \\ & a_{-3}(x) \Big) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) a_{-1}(x) + 5 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-0}(x) \Big) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-0}(x) \Big) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) + 5 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \end{aligned}$$

$$\begin{aligned}
& a_2(x) \Big) r_0(x) r_2(x) a_3(x) a_0(x) + 5 \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x) a_3(x) a_0(x) - 5 \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_1(x) - 4 \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_1(x) r_2(x) a_3(x) a_0(x) \\
& - 6 \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) + 3 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_2(x) \Big) r_0(x) r_2(x) a_2(x) a_0(x) + \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_1(x) a_3(x) a_0(x) + 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x) a_2(x) a_0(x) - \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_1(x) - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_1(x) + 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_2(x) a_1(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_0(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_0(x) r_2(x) a_3(x) \\
& - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x) \\
& - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x) a_3(x) - 2 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) \left(\frac{d^2}{dx^2} r_1(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) - 3 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) \left(\frac{d^2}{dx^2} r_1(x) \right) r_0(x) r_2(x) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-1}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \left. \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-0}(x) + 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \left. \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-0}(x) + \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-3}(x) + 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) r_{-2}(x) a_{-2}(x) a_{-0}(x) + 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-3}(x) + 5 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-3}(x) a_{-1}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \left. \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) r_{-2}(x) a_{-3}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x) \\
& - 2 \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x) - 2 \left(\frac{d^2}{dx^2} \right. \\
& a_{-3}(x) \left. \right) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-0}(x) - 2 \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-0}(x) - \left(\frac{d^3}{dx^3} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \left. \right) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d^3}{dx^3} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \left. \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^3}{dx^3} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-3}(x) a_{-1}(x) - \left(\frac{d^3}{dx^3} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d^3}{dx^3} \right. \\
& r_{-2}(x) \left. \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^3}{dx^3} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-3}(x) a_{-1}(x) - \left(\frac{d^2}{dx^2} a_{-2}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& - 2 \left(\frac{d^2}{dx^2} a_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} \right.
\end{aligned}$$

$$\begin{aligned}
& a_2(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_3(x) a_0(x) - 2 \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \left. \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) + \left(\frac{d^2}{dx^2} a_2(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \left. \right) a_3(x) a_1(x) + 2 \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \left. \right) a_3(x) a_1(x) + \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} a_3(x) \right) r_1(x) r_2(x) a_3(x) a_0(x) \\
& + \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) - \left(\frac{d^3}{dx^3} \right. \\
& r_1(x) \left. \right) \left(\frac{d}{dx} a_3(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) + \left(\frac{d^3}{dx^3} \right. \\
& r_1(x) \left. \right) r_1(x) r_2(x) a_2(x) a_3(x) a_0(x) + \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \left. \right) r_2(x) a_2(x) a_3(x) a_0(x) + 3 \left(\frac{d^2}{dx^2} a_1(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \left. \right) r_2(x) a_3(x) a_0(x) - \left(\frac{d^2}{dx^2} a_1(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \left. \right) a_2(x) a_3(x) - 2 \left(\frac{d^2}{dx^2} a_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \left. \right) a_2(x) a_3(x) + \left(\frac{d^2}{dx^2} a_0(x) \right) r_0(x) r_1(x) r_2(x) a_2(x) a_3(x) \\
& + 2 \left(\frac{d^2}{dx^2} a_0(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_3(x) + \left(\frac{d^2}{dx^2} \right. \\
& a_0(x) \left. \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_2(x) a_3(x) + 2 \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \left. \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_3(x) - 3 \left(\frac{d^2}{dx^2} a_0(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \left. \right) r_2(x) a_3(x) a_1(x) + \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d}{dx} \right. \\
& a_3(x) \left. \right) r_0(x) r_2(x) a_2(x) a_3(x) + \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \left. \right) r_2(x) a_2(x) a_3(x) - \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d}{dx} \right. \\
& a_3(x) \left. \right) r_1(x) r_2(x) a_3(x) a_1(x) - \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned} & r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-1}(x) - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-1}(x) \\ & - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-1}(x) - 2 \left(\frac{d}{dx} \right. \\ & a_{-3}(x) \Big) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) + 2 \left(\frac{d}{dx} \right. \\ & a_{-3}(x) \Big) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-2}(x) \Big) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-2}(x) \Big) r_{-0}(x) r_{-1}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-2}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\ & r_{-1}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\ & r_{-0}(x) \Big) a_{-3}(x) a_{-1}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) \\ & - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} \right. \\ & a_{-3}(x) \Big) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-0}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\ & r_{-1}(x) \Big) r_{-2}(x) a_{-2}(x) a_{-3}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\ & r_{-0}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\ & r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-1}(x) + 3 \left(\frac{d^2}{dx^2} a_{-3}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\ & r_{-1}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-2}(x) a_{-1}(x) - \left(\frac{d^2}{dx^2} \right. \\ & a_{-0}(x) \Big) r_{-1}(x) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} \right. \\ & r_{-0}(x) \Big) a_{-3}(x)^2 - 2 \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 r_{-2}(x) a_{-3}(x) a_{-1}(x) + \left(\frac{d^2}{dx^2} \right. \end{aligned}$$

$$\begin{aligned}
& a_0(x) \Bigg) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_2(x) a_1(x) - \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Bigg) r_2(x)^2 a_3(x) a_0(x) + 2 \left(\frac{d^2}{dx^2} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Bigg) a_3(x)^2 - 2 \left(\frac{d^2}{dx^2} a_0(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) - \left(\frac{d^3}{dx^3} \right. \\
& r_0(x) \Bigg) \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x) a_3(x)^2 a_1(x) - \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d}{dx} \right. \\
& a_2(x) \Bigg) r_0(x) r_2(x) a_3(x)^2 - \left(\frac{d^3}{dx^3} r_0(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Bigg) r_2(x) a_3(x)^2 + \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_2(x)^2 a_3(x) a_0(x) \\
& - \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 + \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_0(x) \Bigg) r_0(x) r_2(x) a_3(x)^2 + \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Bigg) r_2(x) a_3(x)^2 - \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_2(x)^2 a_3(x) a_1(x) \\
& + \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x) a_3(x)^2 a_1(x) + \left(\frac{d^3}{dx^3} \right. \\
& r_2(x) \Bigg) r_0(x) r_1(x) a_3(x)^2 a_0(x) + 2 \left(\frac{d^3}{dx^3} r_2(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Bigg) a_3(x)^2 a_0(x) + \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_3(x)^2 a_0(x) \\
& + 2 \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 a_0(x) - \left(\frac{d^3}{dx^3} \right. \\
& r_2(x) \Bigg) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_1(x) - 2 \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_0(x) \Bigg) a_3(x)^2 a_1(x) - 3 \left(\frac{d^3}{dx^3} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_0(x) \\
& + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_2(x)^2 a_0(x) + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_3(x) \Bigg) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_0(x) - \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} a_3(x) \right) r_2(x)^2 \left(\frac{d}{dx} \right. \\
& r_0(x) \Bigg) a_1(x) + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x)^2 a_3(x) a_0(x) - \left(\frac{d^2}{dx^2} \right.
\end{aligned}$$

$$\begin{aligned}
& a_2(x) \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_1(x) \left. \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) - \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_0(x) \left. \right) r_0(x) r_2(x)^2 a_3(x) - \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \left. \right) r_2(x)^2 a_3(x) + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_0(x) r_2(x) a_3(x)^2 \\
& + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& a_2(x) \left. \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x)^2 a_3(x) a_1(x) + \left(\frac{d^2}{dx^2} \right. \\
& a_2(x) \left. \right) r_0(x) r_2(x)^2 a_2(x) a_0(x) + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \left. \right) r_2(x)^2 a_2(x) a_0(x) - \left(\frac{d^2}{dx^2} a_2(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_1(x) \\
& + 3 \left(\frac{d^2}{dx^2} a_2(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) + \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_2(x) \left. \right) r_2(x) a_3(x)^2 a_0(x) - \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_2(x)^2 a_3(x) a_0(x) \\
& + \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& a_0(x) \left. \right) r_1(x) r_2(x) a_3(x)^2 - \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \left. \right) r_2(x) a_3(x)^2 + \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_2(x)^2 a_2(x) a_3(x) \\
& - \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x) a_2(x) a_3(x)^2 + \left(\frac{d^3}{dx^3} \right. \\
& r_1(x) \left. \right) r_0(x) r_2(x) a_3(x)^2 a_0(x) + 2 \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \left. \right) r_2(x) a_3(x)^2 a_0(x) - 3 \left(\frac{d^3}{dx^3} r_1(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \left. \right) a_3(x)^2 a_0(x) + \left(\frac{d^3}{dx^3} r_1(x) \right) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x)^2 \\
& + 2 \left(\frac{d^3}{dx^3} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x)^2 - \left(\frac{d^3}{dx^3} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-1}(x) \Bigg) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) a_{-0}(x) - \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Bigg) a_{-2}(x)^2 a_{-3}(x) + \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-1}(x) \\
& - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Bigg) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-0}(x) + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Bigg) a_{-2}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} \right. \\
& a_{-3}(x) \Bigg) \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-0}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Bigg) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-1}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Bigg) r_{-1}(x) r_{-2}(x)^2 a_{-0}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) \\
& + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) r_{-1}(x) r_{-2}(x)^2 a_{-1}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x)^2 a_{-1}(x) + \left(\frac{d^2}{dx^2} a_{-3}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} \right. \\
& a_{-3}(x) \Bigg) r_{-0}(x) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) + 2 \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Bigg)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) \\
& - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-0}(x) + 2 \left(\frac{d^2}{dx^2} \right. \\
& a_{-3}(x) \Bigg) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-2}(x) a_{-3}(x) - \left(\frac{d^3}{dx^3} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Bigg) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) + 6 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-0}(x) \Big) a_{-2}(x) a_{-3}(x)^2 - 4 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) a_{-0}(x) - 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 a_{-3}(x) + 6 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 a_{-1}(x) + r_{-0}(x)^2 r_{-1}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 3 r_{-0}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 2 r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) a_{-1}(x) a_{-0}(x) \\
& - 3 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) + 5 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 a_{-1}(x) - r_{-0}(x) r_{-1}(x)^2 a_{-3}(x) a_{-1}(x) a_{-0}(x) \\
& - 3 r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x)^2 + 6 r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 a_{-0}(x) - 6 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-1}(x) a_{-0}(x) \\
& - 6 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x)^2 + 11 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 a_{-0}(x) + r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 a_{-1}(x) \\
& - 2 r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x)^2 + 2 \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big)^2 r_{-1}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 6 \left(\frac{d}{dx} r_{-1}(x) \right)^2 \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 5 \left(\frac{d}{dx} r_{-1}(x) \right)^2 r_{-2}(x) a_{-3}(x) a_{-1}(x) a_{-0}(x) \\
& - \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x)^2 a_{-3}(x) a_{-1}(x) a_{-0}(x) - 6 \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x)^2 + 11 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-3}(x)^2 a_{-0}(x) - 6 \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-1}(x) a_{-0}(x) \\
& - 11 \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x)^2 + 18 \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-0}(x) + 2 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x)^2 a_{-1}(x) - 5 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x)^2
\end{aligned}$$

$$\begin{aligned}
& -3 r_{-I}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) - 3 r_{-I}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) a_{-0}(x)^2 + 5 r_{-I}(x) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-I}(x)^2 \\
& + 3 r_{-I}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 a_{-0}(x) - r_{-I}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-I}(x)^2 - 12 \left(\frac{d}{dx} r_{-2}(x) \right)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& + 4 \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 a_{-0}(x) - 2 \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-I}(x)^2 - 4 r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-I}(x) a_{-0}(x) + 7 r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-2}(x) a_{-3}(x) a_{-I}(x) \\
& - 5 \left(\frac{d}{dx} r_{-I}(x) \right) r_{-I}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-I}(x) a_{-0}(x) + \left(\frac{d}{dx} r_{-I}(x) \right) r_{-I}(x) r_{-2}(x) a_{-2}(x) a_{-I}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} r_{-I}(x) \right) r_{-I}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-I}(x) + 2 \left(\frac{d}{dx} r_{-I}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) a_{-I}(x) a_{-0}(x) - 6 \left(\frac{d}{dx} r_{-I}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-I}(x) - 2 \left(\frac{d}{dx} r_{-I}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) - 13 r_{-I}(x) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) + r_{-I}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-I}(x) a_{-0}(x) \\
& + 6 \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-I}(x) a_{-0}(x) - 4 \left(\frac{d}{dx} a_{-I}(x) \right) r_{-0}(x) r_{-I}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 8 \left(\frac{d}{dx} a_{-I}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 7 \left(\frac{d}{dx} a_{-I}(x) \right) \left(\frac{d}{dx} r_{-I}(x) \right) r_{-I}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 13 \left(\frac{d}{dx} a_{-I}(x) \right) \left(\frac{d}{dx} r_{-I}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d}{dx} a_{-I}(x) \right) \left(\frac{d}{dx} r_{-I}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) - 3 \left(\frac{d}{dx} a_{-I}(x) \right) r_{-I}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) a_{-0}(x) \\
& - 5 \left(\frac{d}{dx} a_{-I}(x) \right) r_{-I}(x) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) + 2 \left(\frac{d}{dx}
\end{aligned}$$

$$\begin{aligned}
& a_{-1}(x) \Big) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x) + 4 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x) - \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) a_{-2}(x) a_{-3}(x) + 5 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-2}(x) a_{-3}(x) + 2 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) \\
& + 4 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-1}(x) + 5 \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x) + 5 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) + 9 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-1}(x) + 3 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-2}(x) a_{-1}(x) + 6 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 6 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x) a_{-3}(x) - 12 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x) a_{-3}(x) + 3 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& + 9 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 7 r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-1}(x) a_{-0}(x) - 5 r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-3}(x) a_{-1}(x) a_{-0}(x) + r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-1}(x) a_{-0}(x) \\
& - r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-1}(x) + 2 r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-2}(x) a_{-1}(x) a_{-0}(x) - 3 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-2}(x) a_{-3}(x) a_{-1}(x) - 3 r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& + 10 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 5 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-0}(x) + \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-2}(x) a_{-0}(x) - 3 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_0(x) \Big) a_3(x) a_1(x) - 5 \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) a_3(x) a_0(x) + \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_2(x) a_0(x) \\
& + 2 \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_0(x) - 7 \left(\frac{d}{dx} \right. \\
& a_2(x) \Big) \left(\frac{d}{dx} r_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) + 5 \left(\frac{d}{dx} \right. \\
& a_2(x) \Big) r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) - \left(\frac{d}{dx} \right. \\
& a_2(x) \Big) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_1(x) - 2 \left(\frac{d}{dx} \right. \\
& a_2(x) \Big) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) - 2 \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_1(x) + 2 \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) + 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_1(x) - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) + 3 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_3(x) a_0(x) \\
& + 9 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) - 9 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x) a_0(x) + 2 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) r_0(x) r_1(x) r_2(x) a_1(x) a_0(x) - \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_1(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_1(x) + 4 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_1(x) a_0(x) \\
& - 3 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) + 3 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_1(x) - 5 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_1(x) r_2(x) a_1(x) a_0(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_1(x) + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_2(x) \Big) r_2(x) a_1(x) a_0(x) - 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_1(x) + 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_2(x) a_1(x) - 7 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_0(x) - 8 \left(\frac{d}{dx} a_3(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_0(x) + 8 \left(\frac{d}{dx} a_3(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_0(x) \\
& + 10 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_0(x) + 2 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) \left(\frac{d}{dx} a_2(x) \right) r_0(x) r_1(x) r_2(x) a_0(x) + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& a_2(x) \Big) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_0(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_1(x) r_2(x) a_0(x) + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_0(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_1(x) - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_1(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) \\
& - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) \\
& - 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_0(x) + 2 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) \left(\frac{d}{dx} a_1(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& a_1(x) \Big) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) + 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) r_0(x) r_1(x) r_2(x) a_2(x) - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_2(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_1(x) r_2(x) a_2(x) \Big) \Big/ \left(a_3(x) \left(\left(\frac{d^2}{dx^2} r_0(x) \right) r_1(x)^2 a_3(x)^2 + \left(\frac{d^2}{dx^2} \right. \right. \right. \\
& r_2(x) \Big) r_0(x)^2 a_3(x)^2 + \left(\frac{d}{dx} a_1(x) \right) r_2(x)^3 a_0(x) - \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& a_0(x) \Big) r_2(x)^3 a_1(x) + 3 r_0(x)^2 \left(\frac{d}{dx} r_1(x) \right) a_3(x)^2 + r_0(x)^2 r_2(x) a_2(x)^2 \\
& + 2 r_0(x) \left(\frac{d}{dx} r_1(x) \right)^2 a_3(x)^2 + r_0(x) r_2(x)^2 a_1(x)^2 - r_1(x)^3 a_3(x) a_0(x) \\
& + 2 r_2(x) \left(\frac{d}{dx} r_0(x) \right)^2 a_3(x)^2 - \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_0(x) \\
& + \left(\frac{d}{dx} a_3(x) \right) r_1(x)^2 r_2(x) a_0(x) + \left(\frac{d}{dx} a_3(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_1(x) \\
& - \left(\frac{d}{dx} a_2(x) \right) r_0(x)^2 r_2(x) a_3(x) + \left(\frac{d}{dx} a_2(x) \right) r_0(x) r_2(x)^2 a_1(x) \\
& - \left(\frac{d}{dx} a_2(x) \right) r_1(x) r_2(x)^2 a_0(x) - \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_2(x)^2 a_2(x) \\
& - \left(\frac{d}{dx} a_1(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) + \left(\frac{d}{dx} a_0(x) \right) r_0(x) r_2(x)^2 a_3(x) \\
& + \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_3(x) - \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 r_2(x) a_3(x) \\
& + \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_2(x) - r_0(x)^2 r_1(x) a_2(x) a_3(x) \\
& - 2 r_0(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) - 2 r_0(x)^2 r_2(x) a_3(x) a_1(x) \\
& + r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x)^2 + r_0(x) r_1(x)^2 a_3(x) a_1(x) \\
& - 3 r_0(x) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 + 2 r_0(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x) a_1(x) \\
& - 2 r_0(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - 2 r_0(x) r_2(x)^2 a_2(x) a_0(x) \\
& - 2 \left(\frac{d}{dx} r_1(x) \right) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_2(x) a_0(x) \\
& - 3 r_1(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) \\
& + r_1(x)^2 r_2(x) a_2(x) a_0(x) + r_1(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) \\
& - 2 r_1(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x) a_0(x) - r_1(x) r_2(x)^2 a_1(x) a_0(x) \\
& - r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x)^2 + r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_1(x)
\end{aligned}$$

$$\begin{aligned}
& -3 r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) + \left(\frac{d}{dx} a_3(x) \right) r_0(x)^2 r_2(x) a_2(x) \\
& - \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_2(x)^2 a_0(x) + r_0(x)^3 a_3(x)^2 + r_2(x)^3 a_0(x)^2 + \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x) - \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_1(x) r_2(x) a_1(x) - \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_0(x) - \left(\frac{d}{dx} a_3(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) - \left(\frac{d}{dx} a_2(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x) + \left(\frac{d}{dx} a_2(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) + \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_1(x) r_2(x) a_3(x) + \left(\frac{d}{dx} a_1(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) - \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) - r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_2(x) a_3(x) - 2 r_0(x) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) - 3 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x) a_1(x) + 3 r_0(x) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_1(x) - r_0(x) r_1(x) r_2(x) a_2(x) a_1(x) + 3 r_0(x) r_1(x) r_2(x) a_3(x) a_0(x) - r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_1(x) + 3 r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) + 2 r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) + 3 \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_3(x) a_0(x) + 2 \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) + r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_0(x) + 2 r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) - 2 \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) + \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) \left(\frac{d}{dx}
\end{aligned}$$

$$\begin{aligned}
& r_{-1}(x) \Big) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) r_{-0}(x) r_{-1}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 \\
& - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) + \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \\
& \left. - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \right) \Big)
\end{aligned}$$

> b1(x) := coeff(M,Dx,1);

$$\begin{aligned}
b1(x) := & - \left(\left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-1}(x) - 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-1}(x) + 5 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) - 5 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) + 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) + \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-0}(x) r_{-1}(x) a_{-2}(x) a_{-3}(x) a_{-1}(x) + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-2}(x) a_{-3}(x) a_{-1}(x) + 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x)^2 a_{-2}(x) a_{-1}(x) - 5 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right.
\end{aligned} \tag{20}$$

$$\begin{aligned}
& r_{-0}(x) \Bigg) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Bigg) r_{-0}(x) a_{-2}(x) a_{-3}(x)^2 - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Bigg) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^2 \\
& - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) - 2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) a_{-3}(x)^2 - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) - 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) a_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Bigg) r_{-2}(x) a_{-3}(x)^2 a_{-1}(x) - 9 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Bigg) a_{-3}(x)^2 a_{-1}(x) + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^2 a_{-0}(x) - 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) r_{-0}(x) r_{-2}(x) a_{-2}(x)^2 a_{-1}(x) + 4 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x)^2 \\
& + 6 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x)^2 + 9 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Bigg) r_{-1}(x) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x)^2 a_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& + \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) - 6 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Bigg) a_{-3}(x)^2 a_{-0}(x) + \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^2 \\
& + 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 + 2 \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& a_{-2}(x) \Bigg) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) - 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Bigg) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 - 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) a_{-3}(x)^2 - 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) - 2 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Bigg) r_{-2}(x)^3 a_{-0}(x)^2 - 2 \left(\frac{d}{dx} a_{-0}(x) \right)^2 r_{-2}(x)^3 a_{-3}(x) + \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) r_{-2}(x)^3 a_{-1}(x)^2 - r_{-0}(x)^3 a_{-3}(x)^2 a_{-1}(x) - r_{-0}(x) r_{-2}(x)^2 a_{-1}(x)^3 \\
& - 6 r_{-0}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-3}(x)^3 - r_{-2}(x)^3 a_{-1}(x) a_{-0}(x)^2 - 2 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) a_{-2}(x) a_{-3}(x) a_{-0}(x) - 4 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) a_{-0}(x) \\
& - 3 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) + 3 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Bigg) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) - 5 \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Bigg) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-1}(x) + 4 \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Bigg) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x) a_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^3}{dx^3} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Bigg) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) + \left(\frac{d^2}{dx^2} \right. \\
& a_{-1}(x) \Bigg) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) + 2 \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x) a_{-2}(x) a_{-3}(x) - 2 \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x) a_{-2}(x) a_{-3}(x) - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& a_3(x) \Big) r_1(x) r_2(x) a_2(x) a_3(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_1(x) \Big) r_0(x) r_2(x) a_3(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) r_1(x) r_2(x) a_3(x) + \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_2(x) \Big) r_0(x) r_1(x) a_3(x) a_1(x) + 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) a_3(x) a_1(x) - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) r_2(x) a_2(x) a_1(x) \\
& + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) r_2(x) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) \left(\frac{d^2}{dx^2} r_2(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) + 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_2(x) \Big) r_1(x) r_2(x) a_2(x) a_0(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_1(x) \Big) r_0(x) r_2(x) a_3(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_0(x) \Big) r_1(x) r_2(x) a_3(x) - \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_1(x) \Big) r_0(x) r_1(x) a_2(x) a_3(x) - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) a_2(x) a_3(x) - 5 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_0(x) r_2(x) a_3(x) a_1(x) \\
& + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_1(x) r_2(x) a_3(x) a_0(x) + 3 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) \left(\frac{d^2}{dx^2} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) + 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_0(x) \Big) r_0(x) r_2(x) a_2(x) a_3(x) + 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) a_2(x) a_3(x) + \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_1(x) r_2(x) a_3(x) a_1(x) \\
& - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_1(x) + \left(\frac{d^2}{dx^2} \right.
\end{aligned}$$

$$\begin{aligned}
& a_3(x) \Bigg) \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) r_2(x) a_3(x) a_1(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_2(x) \Bigg) r_1(x) r_2(x) a_3(x) a_0(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_1(x) \Bigg) r_0(x) r_2(x) a_2(x) a_3(x) + \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_0(x) \Bigg) r_1(x) r_2(x) a_2(x) a_3(x) + 2 \left(\frac{d^2}{dx^2} a_3(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_1(x) \Bigg) r_2(x) a_3(x) a_1(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) r_0(x) r_1(x) r_2(x) a_3(x) a_0(x) \\
& - 2 \left(\frac{d^2}{dx^2} a_3(x) \right) r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) - 2 \left(\frac{d^2}{dx^2} \right. \\
& a_3(x) \Bigg) \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_3(x) a_0(x) - \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_3(x) \Bigg) r_0(x) r_2(x) a_3(x) a_1(x) + \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_3(x) \Bigg) r_1(x) r_2(x) a_3(x) a_0(x) - \left(\frac{d^3}{dx^3} \right. \\
& r_2(x) \Bigg) r_0(x) r_2(x) a_2(x) a_3(x) a_1(x) + \left(\frac{d^3}{dx^3} \right. \\
& r_2(x) \Bigg) r_1(x) r_2(x) a_2(x) a_3(x) a_0(x) - \left(\frac{d^2}{dx^2} \right. \\
& a_2(x) \Bigg) r_0(x) r_1(x) r_2(x) a_3(x) a_1(x) - 2 \left(\frac{d^2}{dx^2} a_2(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Bigg) r_2(x) a_3(x) a_1(x) + 2 \left(\frac{d^2}{dx^2} a_2(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Bigg) r_2(x) a_3(x) a_0(x) - 4 \left(\frac{d}{dx} a_3(x) \right)^2 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_1(x) \\
& + 2 \left(\frac{d}{dx} a_3(x) \right)^2 r_0(x) r_1(x) r_2(x) a_0(x) + 4 \left(\frac{d}{dx} \right. \\
& a_3(x) \Bigg)^2 r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) + 4 \left(\frac{d}{dx} a_3(x) \right)^2 \left(\frac{d}{dx} \right. \\
& r_1(x) \Bigg) r_1(x) r_2(x) a_0(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_1(x)^2 r_2(x) a_0(x)
\end{aligned}$$

$$\begin{aligned}
& + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_0(x)^2 r_2(x) a_3(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_2(x)^2 a_1(x) + 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_0(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_0(x) r_2(x)^2 a_2(x) \\
& + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 r_2(x) a_2(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_1(x) - 4 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_1(x) + \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_2(x) a_3(x) \\
& + 5 \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_1(x) + 2 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_2(x) a_3(x) a_1(x) + 6 r_0(x) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) a_1(x) - r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x) a_3(x) a_0(x) \\
& + 2 r_0(x) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) a_0(x) - 3 r_0(x) r_1(x) r_2(x) a_3(x) a_1(x) a_0(x) - 2 r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_1(x) a_0(x) - 7 r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) a_1(x) - 6 \left(\frac{d}{dx} r_1(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) a_0(x) - 5 \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_3(x) a_1(x) a_0(x) - 2 r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_1(x) a_0(x) + 5 r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) a_0(x) + 6 \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) a_0(x) + \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_1(x) r_2(x) a_2(x) a_0(x)
\end{aligned}$$

$$\begin{aligned}
& -2 \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) - 4 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_0(x) - 6 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) - 7 \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) - 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) + 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_2(x) a_0(x) - 4 \left(\frac{d}{dx} a_3(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_1(x) a_0(x) + 5 \left(\frac{d}{dx} a_3(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) + 6 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) + 7 \left(\frac{d}{dx} a_2(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x) a_1(x) - 5 \left(\frac{d}{dx} a_2(x) \right) r_0(x) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_1(x) + \left(\frac{d}{dx} a_2(x) \right) r_0(x) r_1(x) r_2(x) a_2(x) a_1(x) - 3 \left(\frac{d}{dx} a_2(x) \right) r_0(x) r_1(x) r_2(x) a_3(x) a_0(x) + 2 \left(\frac{d}{dx} a_2(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_1(x) - 6 \left(\frac{d}{dx} a_2(x) \right) r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) - 7 \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_3(x) a_0(x) - 2 \left(\frac{d}{dx} a_2(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_0(x) - \left(\frac{d}{dx} a_1(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x) a_3(x) + 5 \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) - 2 \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_1(x) r_2(x) a_3(x) a_1(x) - 4 \left(\frac{d}{dx} a_1(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_1(x) - 4 \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_1(x) r_2(x) a_3(x) a_1(x)
\end{aligned}$$

$$\begin{aligned}
& r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-1}(x) - \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \\
& + 4 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) a_{-3}(x) + 2 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-1}(x) + 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-1}(x) - 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) - 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-0}(x) + 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-2}(x) - 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-2}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x) \\
& - 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) + 4 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) + 2 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) a_{-3}(x) a_{-1}(x) + 6 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-1}(x) - 6 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) a_{-2}(x) a_{-1}(x) + 4 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x) a_{-3}(x) a_{-0}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-3}(x) a_{-0}(x) - 5 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-1}(x) \right) a_{-3}(x)^2 a_{-1}(x) - 3 r_{-0}(x)^2 \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-2}(x) \Big) a_{-3}(x)^2 a_{-0}(x) - r_{-0}(x)^2 r_{-2}(x) a_{-2}(x)^2 a_{-1}(x) \\
& + 2 r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) a_{-1}(x)^2 + 2 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x)^2 \\
& - 6 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right)^2 a_{-3}(x)^2 a_{-1}(x) - r_{-0}(x) r_{-1}(x)^2 a_{-3}(x) a_{-1}(x)^2 \\
& - 6 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-1}(x)^2 + 2 r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^3 \\
& + 6 \left(\frac{d}{dx} r_{-1}(x) \right)^2 r_{-1}(x) a_{-3}(x)^2 a_{-0}(x) + 3 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x)^2 \\
& + r_{-1}(x)^3 a_{-3}(x) a_{-1}(x) a_{-0}(x) - 3 r_{-1}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-0}(x) \\
& + r_{-1}(x) r_{-2}(x)^2 a_{-1}(x)^2 a_{-0}(x) - 6 \left(\frac{d}{dx} r_{-2}(x) \right)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x)^2 + 2 \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x)^2 - 2 r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 a_{-0}(x) \\
& - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 r_{-0}(x)^2 r_{-2}(x) a_{-1}(x) - 4 \left(\frac{d}{dx} a_{-3}(x) \right)^2 r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \Big) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^3 a_{-0}(x) + \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) r_{-1}(x) r_{-2}(x)^2 a_{-0}(x)^2 + 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-0}(x)^2 \\
& - 2 \left(\frac{d}{dx} a_{-2}(x) \right)^2 r_{-0}(x) r_{-2}(x)^2 a_{-1}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right)^2 r_{-1}(x) r_{-2}(x)^2 a_{-0}(x) \\
& - 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^3 a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-2}(x)^3 a_{-1}(x) - 3 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-1}(x)^2 + \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-1}(x)^3 a_{-3}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-1}(x) \right)^2 r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) - \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-0}(x)^2 r_{-1}(x) a_{-3}(x)^2 - 3 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 \\
& - \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^3 a_{-1}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x)^2
\end{aligned}$$

$$\begin{aligned}
& + \left(\frac{d}{dx} a_0(x) \right) r_0(x) r_1(x)^2 a_3(x)^2 - 2 \left(\frac{d}{dx} a_0(x) \right) r_0(x) r_2(x)^2 a_2(x)^2 \\
& + 2 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_1(x)^2 a_3(x)^2 - \left(\frac{d}{dx} a_0(x) \right) r_1(x)^3 a_2(x) a_3(x) + \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 r_2(x) a_2(x)^2 + 2 \left(\frac{d}{dx} a_0(x) \right) r_2(x)^3 a_2(x) a_0(x) - 3 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_3(x) a_1(x) - 5 \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) \\
& + \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 r_2(x) a_3(x) a_1(x) - 6 \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_2(x) a_3(x) + 2 \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x)^2 - 2 \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_2(x) a_1(x) - \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_3(x) a_0(x) - 5 \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 + 6 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right)^2 r_2(x) a_3(x) a_1(x) - 2 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_2(x) a_1(x) - 4 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x)^2 a_3(x) a_0(x) - 6 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 + 2 \left(\frac{d}{dx} a_0(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) \\
& + r_0(x)^2 r_1(x) a_2(x) a_3(x) a_1(x) + 3 r_0(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) a_1(x) + 3 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_3(x)^2 a_0(x) - 6 r_0(x) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 a_0(x) - 2 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x)^2 a_1(x) + 5 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x) a_1(x)^2
\end{aligned}$$

$$\begin{aligned}
& + 6 r_0(x) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x)^2 - 5 r_0(x) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_1(x)^2 + r_0(x) r_1(x) r_2(x) a_2(x) a_1(x)^2 - 2 r_0(x) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x)^2 a_3(x) + 5 r_0(x) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_1(x) \\
& + 6 r_0(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_2(x) a_3(x) a_0(x) - 2 r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x)^2 a_0(x) + 2 r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_1(x)^2 \\
& - 6 r_0(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_2(x)^2 a_3(x) + 12 r_0(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_1(x) + 2 r_0(x) r_2(x)^2 a_2(x) a_1(x) a_0(x) \\
& + 3 r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_0(x) - 2 \left(\frac{d}{dx} r_1(x) \right) r_1(x)^2 a_2(x) a_3(x) a_0(x) + 2 \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_2(x)^2 a_0(x) \\
& - 6 \left(\frac{d}{dx} r_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_0(x) + 5 r_1(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_1(x) a_0(x) - r_1(x)^2 r_2(x) a_2(x) a_1(x) a_0(x) \\
& + 6 r_1(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x) a_1(x) a_0(x) - 3 r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x)^2 - 6 r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_0(x) \\
& + 2 r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) a_0(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_2(x)^3 a_0(x) + \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_2(x)^3 a_1(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) r_0(x) r_2(x)^2 a_1(x)^2 - \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_0(x) a_3(x)^3 \\
& + \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_1(x) a_3(x)^3 - 2 \left(\frac{d^3}{dx^3} r_2(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right)
\end{aligned}$$

$$\begin{aligned}
& r_{-0}(x) \Big) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} r_{-2}(x) \right) r_{-1}(x)^2 a_{-3}(x)^2 a_{-0}(x) + \left(\frac{d^3}{dx^3} r_{-1}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-0}(x) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} r_{-1}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} \right. \\
& r_{-1}(x) \Big) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x) a_{-3}(x)^3 + 2 \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) a_{-3}(x)^3 + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^3 a_{-0}(x) - \left(\frac{d^2}{dx^2} \right. \\
& a_{-1}(x) \Big) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^3 a_{-3}(x) + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x)^2 a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& a_{-1}(x) \Big) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x)^2 + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-2}(x)^3 a_{-2}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} \right. \\
& a_{-0}(x) \Big) \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^3 a_{-1}(x) - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Big) r_{-2}(x)^2 a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^3 a_{-3}(x) + \left(\frac{d^2}{dx^2} \right. \\
& a_{-0}(x) \Big) r_{-1}(x) r_{-2}(x)^2 a_{-2}(x)^2 - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-2}(x)^3 a_{-2}(x) a_{-1}(x) + \left(\frac{d^2}{dx^2} \right. \\
& a_{-0}(x) \Big) r_{-2}(x)^3 a_{-3}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x)^2 - 2 \left(\frac{d^2}{dx^2} \right. \\
& a_{-0}(x) \Big) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-1}(x) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Big) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^3 \\
& - 2 \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Big) r_{-1}(x)^2 a_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x)^2 a_{-0}(x) + 2 \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Big) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} \right.
\end{aligned}$$

$$\begin{aligned}
& r_{-I}(x) \Big) r_{-2}(x)^2 a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-I}(x) \\
& - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right)^2 r_{-0}(x) a_{-3}(x)^2 a_{-I}(x) + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right)^2 r_{-I}(x) a_{-3}(x)^2 a_{-0}(x) \\
& + \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-I}(x)^2 a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-0}(x) a_{-3}(x)^3 - 4 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x)^2 a_{-3}(x)^2 a_{-I}(x) + 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x)^2 - \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-I}(x)^2 a_{-3}(x)^2 \\
& + 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-I}(x) a_{-3}(x)^3 + \left(\frac{d^2}{dx^2} \right. \\
& r_{-I}(x) \Big) r_{-0}(x)^2 a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x)^3 - 9 \left(\frac{d^2}{dx^2} \right. \\
& r_{-I}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 - 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-I}(x)^2 a_{-3}(x)^2 a_{-0}(x) \\
& - \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-2}(x)^2 a_{-2}(x)^2 a_{-0}(x) + 5 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-2}(x)^2 a_{-3}(x)^2 + 6 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-I}(x) \right) a_{-3}(x)^3 + \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-I}(x)^2 a_{-2}(x)^2 a_{-3}(x) - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-I}(x)^2 a_{-3}(x)^2 a_{-I}(x) - \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Big) r_{-I}(x) r_{-2}(x) a_{-2}(x)^3 + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-I}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 \\
& + \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x)^2 a_{-I}(x) - 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right)^2 r_{-2}(x) a_{-3}(x)^3 \\
& + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x)^2 a_{-3}(x)^3 - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) r_{-2}(x)^3 a_{-0}(x)^2 + \left(\frac{d^3}{dx^3} \right. \\
& r_{-I}(x) \Big) r_{-0}(x)^2 a_{-3}(x)^3 - 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right)^2 r_{-0}(x) a_{-3}(x)^3 + 3 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) a_{-I}(x) - \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-I}(x)^2 a_{-3}(x) a_{-I}(x) \\
& + 2 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-I}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 - 6 \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& a_{-2}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-1}(x) + 6 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 + 2 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) \\
& + 5 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-1}(x)^2 r_{-2}(x) a_{-2}(x) a_{-0}(x) + 6 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big)^2 a_{-3}(x) a_{-0}(x) + 3 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) + 4 \left(\frac{d}{dx} \right. \\
& a_{-2}(x) \Big) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-1}(x) r_{-2}(x)^2 a_{-3}(x) - 2 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) a_{-3}(x)^2 \\
& - 6 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 + \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-0}(x) r_{-1}(x)^2 a_{-2}(x) a_{-3}(x) - \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-2}(x)^2 \\
& + 6 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-2}(x) a_{-3}(x) - 2 \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x)^2 + 3 \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-1}(x) - 2 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) \\
& + 7 \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 + 3 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + \left(\frac{d}{dx} a_{-1}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-1}(x) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) - 6 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) \\
& - 4 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Big) r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 + \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& a_{-0}(x) \Big) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) + 6 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-3}(x)^2 + 4 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) \\
& + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x)^2 r_{-1}(x) a_{-3}(x) a_{-1}(x) + 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) a_{-3}(x) a_{-1}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-2}(x) a_{-1}(x) + 2 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-1}(x)^2 a_{-3}(x) a_{-0}(x) \\
& + 2 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-1}(x)^2 + 4 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-1}(x)^2 + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) + 6 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Big) r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Big) r_{-1}(x)^2 a_{-3}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-1}(x) a_{-0}(x) \\
& - 6 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Big) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) + 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) \\
& - 2 \left(\frac{d}{dx} a_{-2}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-2}(x) + \left(\frac{d^3}{dx^3} \right. \\
& r_{-1}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-2}(x)^2 a_{-3}(x) - \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 a_{-1}(x) \\
& + \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) + 2 \left(\frac{d^3}{dx^3} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Big) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) - \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Big) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) \\
& - 2 \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} \right.
\end{aligned}$$

$$\begin{aligned}
& a_{-1}(x) \Bigg) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) \\
& - 2 \left(\frac{d^2}{dx^2} a_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Bigg) r_{-1}(x) r_{-2}(x)^2 a_{-2}(x) + \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 \\
& - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-3}(x) + \left(\frac{d^2}{dx^2} \right. \\
& a_{-0}(x) \Bigg) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 + 2 \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Bigg) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-2}(x) a_{-3}(x) \\
& + 2 \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Bigg) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 \\
& + 2 \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Bigg) r_{-1}(x) r_{-2}(x) a_{-2}(x)^2 a_{-3}(x) - 2 \left(\frac{d^3}{dx^3} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x) a_{-3}(x)^2 a_{-1}(x) + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) a_{-1}(x) \\
& - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-1}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) r_{-1}(x) r_{-2}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) \\
& - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) - \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-2}(x) \Bigg) r_{-1}(x)^2 a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) r_{-2}(x)^2 a_{-3}(x) + 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x)^2 \\
& - 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Bigg) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) - \left(\frac{d^2}{dx^2} a_{-3}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& a_2(x) \Big) r_0(x) r_2(x)^2 a_1(x) + \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_1(x) r_2(x)^2 a_0(x) \\
& + \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x)^2 a_3(x) a_0(x) + \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& a_1(x) \Big) r_0(x) r_2(x)^2 a_2(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_2(x) \\
& - \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_2(x)^2 a_3(x) a_1(x) + \left(\frac{d^2}{dx^2} \right. \\
& a_3(x) \Big) r_0(x)^2 r_2(x) a_3(x) a_1(x) + \left(\frac{d^2}{dx^2} a_3(x) \right) r_0(x) r_2(x)^2 a_2(x) a_0(x) \\
& + \left(\frac{d^2}{dx^2} a_3(x) \right) r_1(x) r_2(x)^2 a_1(x) a_0(x) + 2 \left(\frac{d^2}{dx^2} a_3(x) \right) r_2(x)^2 \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) a_0(x) + \left(\frac{d^3}{dx^3} r_2(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_2(x) a_3(x)^2 - \left(\frac{d^3}{dx^3} \right. \\
& r_2(x) \Big) \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x) a_3(x)^2 + \left(\frac{d^3}{dx^3} \right. \\
& r_2(x) \Big) r_0(x) r_1(x) a_3(x)^2 a_1(x) + 2 \left(\frac{d^3}{dx^3} r_2(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) a_3(x)^2 a_1(x) + \left(\frac{d^3}{dx^3} r_2(x) \right) r_0(x) r_2(x) a_3(x)^2 a_0(x) - 2 \left(\frac{d^3}{dx^3} \right. \\
& r_2(x) \Big) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 a_0(x) + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) r_0(x) r_2(x)^2 a_1(x) - \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} a_3(x) \right) r_1(x) r_2(x)^2 a_0(x) \\
& + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d^2}{dx^2} r_1(x) \right) r_0(x) r_2(x) a_3(x)^2 - \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} \right. \\
& a_1(x) \Big) r_0(x) r_2(x)^2 a_3(x) + \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_3(x) \\
& - \left(\frac{d^2}{dx^2} a_2(x) \right) \left(\frac{d^2}{dx^2} r_0(x) \right) r_1(x) r_2(x) a_3(x)^2 + \left(\frac{d^2}{dx^2} \right. \\
& a_2(x) \Big) r_0(x) r_2(x)^2 a_2(x) a_1(x) - \left(\frac{d^2}{dx^2} a_2(x) \right) r_0(x) r_2(x)^2 a_3(x) a_0(x) \\
& + 2 \left(\frac{d^2}{dx^2} a_2(x) \right) r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 + \left(\frac{d^2}{dx^2} \right. \\
& a_2(x) \Big) r_1(x)^2 r_2(x) a_3(x) a_0(x) - \left(\frac{d^2}{dx^2} a_2(x) \right) r_1(x) r_2(x)^2 a_2(x) a_0(x)
\end{aligned}$$

$$\begin{aligned}
& - \left(\frac{d^3}{dx^3} r_{-I}(x) \right) \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) - \left(\frac{d^3}{dx^3} r_{-I}(x) \right) \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} r_{-I}(x) \right) r_{-0}(x) r_{-I}(x) a_{-2}(x) a_{-3}(x)^2 \\
& - 2 \left(\frac{d^3}{dx^3} r_{-I}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x)^2 - 4 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x)^2 - 6 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x)^2 \\
& + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x)^2 a_{-3}(x) - 2 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 a_{-I}(x) - 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-I}(x) \right) r_{-I}(x) a_{-2}(x) a_{-3}(x)^2 \\
& + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-I}(x) \right) r_{-I}(x) a_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-I}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-I}(x) \\
& + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-I}(x) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) + 9 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-I}(x) \\
& + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-I}(x) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) - 4 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& + 5 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d}{dx} a_{-I}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 - 4 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-I}(x) r_{-2}(x) a_{-3}(x)^2 \\
& - 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} r_{-I}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) \\
& + 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-I}(x) \right) a_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) r_{-I}(x) a_{-2}(x)^2 a_{-3}(x) + 4 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) r_{-I}(x) a_{-3}(x)^2 a_{-I}(x) \\
& - 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x)^2 a_{-3}(x) + 9 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-I}(x) + 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-I}(x) \\
& + 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-I}(x) + 3 \left(\frac{d^2}{dx^2} r_{-I}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-I}(x)
\end{aligned}$$

$$\begin{aligned}
& r_{-1}(x) \Bigg) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) - 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Bigg) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) - 6 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) a_{-3}(x)^2 a_{-0}(x) + \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) a_{-0}(x) - \left(\frac{d}{dx} \right. \\
& a_{-1}(x) \Bigg) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d}{dx} a_{-1}(x) \right) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \Bigg) \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x)^2 a_{-2}(x) a_{-3}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d^2}{dx^2} \right. \\
& r_{-0}(x) \Bigg) r_{-1}(x) r_{-2}(x) a_{-2}(x)^2 \Bigg) / \left(a_{-3}(x) \left(\left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x)^2 a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} \right. \right. \right. \\
& r_{-2}(x) \Bigg) r_{-0}(x)^2 a_{-3}(x)^2 + \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^3 a_{-0}(x) - \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) r_{-2}(x)^3 a_{-1}(x) + 3 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-1}(x) \right) a_{-3}(x)^2 + r_{-0}(x)^2 r_{-2}(x) a_{-2}(x)^2 \\
& + 2 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right)^2 a_{-3}(x)^2 + r_{-0}(x) r_{-2}(x)^2 a_{-1}(x)^2 - r_{-1}(x)^3 a_{-3}(x) a_{-0}(x) \\
& + 2 r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-3}(x)^2 - \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-0}(x) \\
& + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-0}(x) + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-1}(x) \\
& - \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-1}(x) \\
& - \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-0}(x) - \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) \\
& - \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) + \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) \\
& + \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x) - \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-3}(x) \\
& + \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-2}(x) - r_{-0}(x)^2 r_{-1}(x) a_{-2}(x) a_{-3}(x) \\
& - 2 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x) a_{-3}(x) - 2 r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) a_{-1}(x)
\end{aligned}$$

$$\begin{aligned}
& + r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x)^2 + r_{-0}(x) r_{-1}(x)^2 a_{-3}(x) a_{-1}(x) \\
& - 3 r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 + 2 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-1}(x) \\
& - 2 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 - 2 r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) \\
& - 2 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 - \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) - 3 r_{-1}(x)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-0}(x) \\
& + r_{-1}(x)^2 r_{-2}(x) a_{-2}(x) a_{-0}(x) + r_{-1}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) \\
& - 2 r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x) a_{-0}(x) - r_{-1}(x) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) \\
& - r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 + r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-1}(x) \\
& - 3 r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-0}(x) + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-2}(x) \\
& - \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-0}(x) + r_{-0}(x)^3 a_{-3}(x)^2 + r_{-2}(x)^3 a_{-0}(x)^2 + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x) - \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-1}(x) - \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-0}(x) - \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) - \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} a_{-2}(x) \right) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) + \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) - \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) - r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) a_{-2}(x) a_{-3}(x) - 2 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x)
\end{aligned}$$

$$\begin{aligned}
& r_{-2}(x) \Big) a_{-2}(x) a_{-3}(x) - 3 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x) a_{-1}(x) \\
& + 3 r_{-0}(x) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x) a_{-1}(x) - r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-1}(x) \\
& + 3 r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) - r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) a_{-1}(x) \\
& + 3 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x) a_{-0}(x) + 2 r_{-0}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) \\
& + 3 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-2}(x) a_{-0}(x) \\
& + 2 r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) - 2 \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x) \\
& + \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 \\
& - \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 \\
& - \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 \\
& - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^2 \\
& + \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) \\
& - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) + \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \\
& - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \Big) \Big)
\end{aligned}$$

> b2(x) := coeff(M,Dx,2);

$$\begin{aligned}
b2(x) := & - \left(-3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^3 - 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^3 \right. \\
& \left. - 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x)^2 a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \right)
\end{aligned} \tag{21}$$

$$\begin{aligned}
& r_{-0}(x) \Bigg) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} r_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) a_{-3}(x)^3 \\
& - \left(\frac{d^3}{dx^3} r_{-2}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 - \left(\frac{d^2}{dx^2} \right. \\
& a_{-2}(x) \Bigg) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-0}(x) r_{-1}(x) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} \right. \\
& r_{-1}(x) \Bigg) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x)^2 a_{-0}(x) \\
& + \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 + \left(\frac{d^2}{dx^2} \right. \\
& a_{-1}(x) \Bigg) r_{-2}(x)^3 a_{-3}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 \\
& + \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Bigg) r_{-2}(x)^2 a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& a_{-0}(x) \Bigg) r_{-2}(x)^3 a_{-3}(x) a_{-1}(x) - \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^3 - \left(\frac{d^3}{dx^3} \right. \\
& r_{-0}(x) \Bigg) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^3 \\
& + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x)^2 a_{-1}(x) - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x)^2 a_{-2}(x) a_{-3}(x)^2 \\
& - 3 \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-1}(x)^2 a_{-3}(x)^2 a_{-0}(x) + 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \Bigg) a_{-3}(x)^3 - 3 \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} \right. \\
& r_{-2}(x) \Bigg) r_{-0}(x)^2 a_{-3}(x)^3 + \left(\frac{d^3}{dx^3} r_{-0}(x) \right) r_{-1}(x)^2 a_{-3}(x)^3 + 3 \left(\frac{d^2}{dx^2} \right. \\
& r_{-1}(x) \Bigg) r_{-0}(x)^2 a_{-3}(x)^3 + \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) \\
& + 3 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 + 5 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \Bigg) r_{-2}(x) a_{-3}(x)^2 - 3 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} \right. \\
& a_{-0}(x) \Bigg) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 + 3 \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_2(x) \Big) r_2(x) a_3(x)^2 - \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_2(x) a_3(x) \\
& + 2 \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 r_2(x) a_2(x) a_3(x) - \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_3(x) a_1(x) - 3 \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_2(x) \right) \\
& r_2(x) \Big) r_2(x)^2 a_3(x) a_1(x) + 2 r_0(x)^2 r_2(x) a_2(x) a_3(x) a_1(x) + r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_2(x)^2 a_3(x) \\
& + 2 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_3(x)^2 a_1(x) + 3 r_0(x) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} r_2(x) \right) a_2(x)^2 a_3(x) + 3 r_0(x) \left(\frac{d}{dx} r_1(x) \right) \\
& r_2(x) \Big) r_2(x) a_3(x)^2 a_0(x) - r_0(x) r_1(x)^2 a_2(x) a_3(x) a_1(x) + 3 r_0(x) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 a_0(x) \\
& + r_0(x) r_1(x) r_2(x) a_2(x)^2 a_1(x) + r_0(x) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x)^2 - 3 r_0(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_2(x) a_3(x) a_1(x) + r_0(x) \left(\frac{d}{dx} r_2(x) \right) \\
& r_2(x) \Big) r_2(x) a_2(x)^2 a_1(x) + 2 r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_1(x)^2 - 4 r_0(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_1(x) - 3 \left(\frac{d}{dx} r_1(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) \\
& r_2(x) \Big) a_3(x)^2 a_0(x) + 3 \left(\frac{d}{dx} r_1(x) \right) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x)^2 - \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_3(x) a_1(x) a_0(x) - 3 \left(\frac{d}{dx} r_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) \\
& r_2(x) \Big) a_3(x)^2 a_1(x) + 4 r_1(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) a_0(x) + 3 r_1(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_2(x) a_3(x) a_0(x) - r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \\
& r_2(x) \Big) r_2(x) a_2(x)^2 a_0(x) - 3 r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_2(x)^2 a_3(x) + 3 r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_1(x)
\end{aligned}$$

$$\begin{aligned}
& + r_{-1}(x) r_{-2}(x)^2 a_{-2}(x) a_{-1}(x) a_{-0}(x) + 3 r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-3}(x)^2 a_{-0}(x) - 3 \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-0}(x) \\
& + r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \left. \right) r_{-2}(x)^2 a_{-3}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-3}(x) \\
& - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-2}(x) + \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \left. \right) r_{-0}(x)^2 r_{-1}(x) a_{-2}(x) a_{-3}(x) + 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) a_{-2}(x) a_{-3}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) a_{-1}(x) - 3 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \left. \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x)^2 - \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \left. \right) r_{-0}(x) r_{-1}(x)^2 a_{-3}(x) a_{-1}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right)^2 a_{-3}(x) a_{-1}(x) + 5 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) + 3 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \left. \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x) a_{-0}(x) + 4 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right) a_{-3}(x) a_{-0}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-2}(x) a_{-0}(x) - \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \left. \right) r_{-1}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x) a_{-3}(x) + 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x) \left(\frac{d}{dx} \right. \\
& r_{-2}(x) \left. \right)^2 a_{-3}(x) a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-1}(x) a_{-0}(x) + 3 \left(\frac{d}{dx} \right. \\
& a_{-3}(x) \left. \right) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 - 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} \right. \\
& r_{-0}(x) \left. \right) a_{-2}(x) a_{-1}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-0}(x) \\
& + 3 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-2}(x) a_{-3}(x) - \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} \right. \\
& r_{-1}(x) \left. \right) r_{-1}(x) a_{-3}(x)^2 - 3 \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2
\end{aligned}$$

$$- \left(\frac{d}{dx} a_2(x) \right) r_{0}(x) r_{2}(x)^2 a_2(x) a_I(x) - 2 \left(\frac{d}{dx} a_2(x) \right) r_{0}(x) r_{2}(x)^2 a_3(x) a_0(x) - 2 \left(\frac{d}{dx} a_2(x) \right) \left(\frac{d}{dx} r_I(x) \right) r_{2}(x)^2 a_3(x) a_0(x) + \left(\frac{d}{dx} a_2(x) \right) r_I(x)^2 r_{2}(x) a_3(x) a_0(x) \\ + 3 \left(\frac{d}{dx} a_2(x) \right) r_I(x) \left(\frac{d}{dx} r_{2}(x) \right) \left(\frac{d}{dx} r_{0}(x) \right) a_3(x)^2 + \left(\frac{d}{dx} a_2(x) \right) r_I(x) r_{2}(x)^2 a_2(x) a_0(x) + 2 \left(\frac{d}{dx} a_2(x) \right) r_{2}(x)^2 \left(\frac{d}{dx} r_{0}(x) \right) a_3(x) a_I(x) - 2 \left(\frac{d}{dx} a_I(x) \right) r_{0}(x) \left(\frac{d}{dx} r_I(x) \right) r_{2}(x) a_3(x)^2 \\ + 4 \left(\frac{d}{dx} a_I(x) \right) r_{0}(x) r_I(x) \left(\frac{d}{dx} r_{2}(x) \right) a_3(x)^2 + 2 \left(\frac{d}{dx} a_I(x) \right) r_{0}(x) r_{2}(x)^2 a_3(x) a_I(x) - \left(\frac{d}{dx} a_I(x) \right) r_I(x) r_{2}(x)^2 a_3(x) a_0(x) \\ + \left(\frac{d}{dx} a_I(x) \right) r_I(x) r_{2}(x) \left(\frac{d}{dx} r_{0}(x) \right) a_3(x)^2 + 3 \left(\frac{d}{dx} a_I(x) \right) \left(\frac{d}{dx} r_{2}(x) \right) r_{2}(x)^2 a_3(x) a_0(x) - 3 \left(\frac{d}{dx} a_I(x) \right) \left(\frac{d}{dx} r_{2}(x) \right) r_{2}(x) \left(\frac{d}{dx} r_{0}(x) \right) a_3(x)^2 - 2 \left(\frac{d}{dx} a_3(x) \right)^2 r_{0}(x) \left(\frac{d}{dx} r_I(x) \right) r_{2}(x) a_2(x) + 2 \left(\frac{d}{dx} a_3(x) \right)^2 r_{0}(x) r_I(x) r_{2}(x) a_I(x) + 2 \left(\frac{d}{dx} a_3(x) \right)^2 r_{0}(x) \left(\frac{d}{dx} r_{2}(x) \right) r_{2}(x) a_0(x) \\ + 2 \left(\frac{d}{dx} a_3(x) \right)^2 r_I(x) r_{2}(x) \left(\frac{d}{dx} r_{0}(x) \right) a_2(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_{0}(x) r_{2}(x)^2 a_I(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_I(x) r_{2}(x)^2 a_0(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_I(x) \right) r_{2}(x)^2 \left(\frac{d}{dx} r_{0}(x) \right) a_3(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_0(x) \right) r_{0}(x) r_{2}(x)^2 a_3(x) - 4 \left(\frac{d}{dx} a_3(x) \right)$$

$$\begin{aligned}
& a_3(x) \Big) r_0(x) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_1(x) + 3 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) r_0(x) r_1(x) r_2(x) a_2(x) a_1(x) - 3 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) r_0(x) r_1(x) r_2(x) a_3(x) a_0(x) + 3 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_2(x) a_1(x) - 5 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_3(x) a_0(x) - \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_1(x) r_2(x) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} a_3(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_2(x) a_0(x) - 3 \left(\frac{d}{dx} a_3(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_2(x) a_3(x) - \left(\frac{d}{dx} a_3(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) \\
& + 3 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) + 3 \left(\frac{d}{dx} \right. \\
& a_2(x) \Big) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x) a_3(x) - \left(\frac{d}{dx} \right. \\
& a_2(x) \Big) r_0(x) r_1(x) r_2(x) a_3(x) a_1(x) + \left(\frac{d}{dx} a_2(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_3(x) a_1(x) - \left(\frac{d}{dx} a_2(x) \right) r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} a_2(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_2(x) a_3(x) - 2 \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_1(x) r_2(x) a_2(x) a_3(x) \\
& - 4 \left(\frac{d}{dx} a_1(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_3(x) + 4 \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_3(x) + 2 r_0(x) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x) a_2(x) a_3(x) a_1(x) - 4 r_0(x) r_1(x) \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& r_2(x) \Big) a_2(x) a_3(x) a_1(x) - 3 r_0(x) r_1(x) r_2(x) a_2(x) a_3(x) a_0(x) \\
& - 7 r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_3(x) a_0(x) - \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_1(x) r_2(x) a_2(x) a_3(x) a_0(x) - 3 \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_2(x) a_3(x) a_0(x) - 2 r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_3(x) a_1(x) a_0(x) - r_1(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_2(x) a_3(x) a_1(x) + 3 \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_2(x) a_3(x) a_1(x) + 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x) a_3(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_2(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_3(x) - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_1(x) r_2(x) a_3(x) \\
& - 2 \left(\frac{d}{dx} a_3(x) \right) \left(\frac{d}{dx} a_1(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) + 2 \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) + \left(\frac{d}{dx} \right. \\
& a_3(x) \Big) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_2(x) a_3(x) + 3 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) + 2 \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x) a_3(x) a_1(x) - 2 \left(\frac{d}{dx} a_3(x) \right) r_2(x)^3 a_0(x)^2 - \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) r_1(x)^3 a_3(x)^2 - r_0(x)^3 a_2(x) a_3(x)^2 - r_0(x)^2 r_2(x) a_2(x)^3 \\
& + 3 r_0(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x)^3 - 3 r_1(x) \left(\frac{d}{dx} r_0(x) \right)^2 a_3(x)^3 \\
& - r_2(x)^3 a_2(x) a_0(x)^2 - 3 \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x)^2 - \left(\frac{d}{dx} \right. \\
& a_0(x) \Big) r_1(x) r_2(x)^2 a_2(x)^2 + \left(\frac{d}{dx} a_0(x) \right) r_2(x)^3 a_2(x) a_1(x) + 2 \left(\frac{d}{dx} \right.
\end{aligned}$$

$$\begin{aligned}
& a_{-0}(x) \Big) r_{-2}(x)^3 a_{-3}(x) a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 \\
& - 4 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-1}(x) \right) a_{-2}(x) a_{-3}(x)^2 + r_{-0}(x)^2 r_{-1}(x) a_{-2}(x)^2 a_{-3}(x) \\
& + 3 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-2}(x)^2 a_{-3}(x) - 2 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-2}(x) \right) a_{-3}(x)^2 a_{-1}(x) \\
& - 3 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right)^2 a_{-2}(x) a_{-3}(x)^2 - r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-2}(x)^3 \\
& + 3 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^3 + 3 r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right)^2 a_{-3}(x)^2 a_{-0}(x) \\
& + 2 r_{-0}(x) r_{-2}(x)^2 a_{-2}(x)^2 a_{-0}(x) - r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-1}(x)^2 + 3 \left(\frac{d}{dx} r_{-1}(x) \right)^2 r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) \\
& - 3 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-1}(x)^2 a_{-3}(x)^2 a_{-0}(x) + \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-2}(x)^2 a_{-0}(x) \\
& + r_{-1}(x)^3 a_{-2}(x) a_{-3}(x) a_{-0}(x) - r_{-1}(x)^2 r_{-2}(x) a_{-2}(x)^2 a_{-0}(x) - r_{-1}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 a_{-3}(x) \\
& + r_{-1}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 a_{-1}(x) + r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^3 + 3 \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x)^2 \\
& - r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-2}(x)^2 a_{-1}(x) + r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x)^2 - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 r_{-0}(x)^2 r_{-2}(x) a_{-2}(x) \\
& + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 r_{-0}(x) r_{-2}(x)^2 a_{-0}(x) + 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-0}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 r_{-1}(x)^2 r_{-2}(x) a_{-0}(x) \\
& - 2 \left(\frac{d}{dx} a_{-3}(x) \right)^2 r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-1}(x) - 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^3 a_{-0}(x) \\
& + 2 \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^3 a_{-1}(x) - 3 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-2}(x)^2 - 2 \left(\frac{d}{dx} a_{-3}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-1}(x)^2 \\
& + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x)^3 a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x)^3 a_{-3}(x) a_{-0}(x) - \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x)^3 a_{-3}(x) a_{-0}(x)
\end{aligned}$$

$$\begin{aligned}
& a_2(x) \Big) r_0(x)^2 r_1(x) a_3(x)^2 - 3 \left(\frac{d}{dx} a_2(x) \right) r_0(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 \\
& + \left(\frac{d}{dx} a_2(x) \right) r_1(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - 2 \left(\frac{d}{dx} a_1(x) \right) r_0(x)^2 r_2(x) a_3(x)^2 + \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_1(x)^2 a_3(x)^2 + 3 \left(\frac{d}{dx} a_1(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x)^2 + \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_2(x)^2 a_2(x)^2 \\
& - \left(\frac{d}{dx} a_1(x) \right) r_2(x)^3 a_2(x) a_0(x) - 4 \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 + \left(\frac{d^2}{dx^2} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x) a_3(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) r_0(x) r_1(x) r_2(x) a_3(x) a_1(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_1(x) + \left(\frac{d^2}{dx^2} a_3(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) + \left(\frac{d^2}{dx^2} a_0(x) \right) r_1(x) r_2(x)^2 a_2(x) a_3(x) - \left(\frac{d^3}{dx^3} r_0(x) \right) r_1(x) r_2(x) a_2(x) a_3(x)^2 + 3 \left(\frac{d^2}{dx^2} r_0(x) \right) r_0(x) r_2(x) a_2(x) a_3(x)^2 - 3 \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) a_2(x) a_3(x)^2 + 3 \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) r_1(x) a_3(x)^2 a_1(x) + 3 \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 a_0(x) + 3 \left(\frac{d^2}{dx^2} r_2(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x)^2 a_0(x) - 3 \left(\frac{d^2}{dx^2} r_2(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 a_0(x) + 3 \left(\frac{d^2}{dx^2} r_2(x) \right) a_3(x)^2 a_0(x) + 3 \left(\frac{d^2}{dx^2} r_2(x) \right) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x)^2 - 3 \left(\frac{d^2}{dx^2} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 a_1(x) - 3 \left(\frac{d^2}{dx^2} r_1(x) \right) r_0(x) r_2(x) a_3(x)^2 a_1(x) + 3 \left(\frac{d^2}{dx^2} r_1(x) \right) r_1(x) r_2(x) a_3(x)^2 a_0(x)
\end{aligned}$$

$$\begin{aligned}
& + \left(\frac{d^2}{dx^2} a_3(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-2}(x) a_{-3}(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) - \left(\frac{d^2}{dx^2} a_3(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) \\
& + \left(\frac{d^2}{dx^2} a_3(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} a_3(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-3}(x) a_{-0}(x) \\
& + \left(\frac{d^2}{dx^2} a_3(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x) a_{-1}(x) - \left(\frac{d^3}{dx^3} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x)^2 a_{-1}(x) + \left(\frac{d^3}{dx^3} r_{-2}(x) \right) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 a_{-0}(x) \\
& - \left(\frac{d^2}{dx^2} a_2(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} a_2(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) - \left(\frac{d^2}{dx^2} a_2(x) \right) r_{-1}(x) r_{-2}(x)^2 a_{-3}(x) a_{-0}(x) \\
& + \left(\frac{d^2}{dx^2} a_2(x) \right) r_{-1}(x) r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right) a_{-3}(x)^2 + \left(\frac{d^3}{dx^3} r_{-1}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-0}(x) r_{-1}(x) r_{-2}(x) a_{-3}(x)^2 \\
& + \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-0}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x)^2 - \left(\frac{d^2}{dx^2} a_{-1}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-2}(x) a_{-3}(x) - \left(\frac{d^2}{dx^2} a_{-0}(x) \right) r_{-1}(x) \left(\frac{d}{dx} r_{-2}(x) \right) r_{-2}(x) a_{-3}(x)^2 \Bigg/ \left(a_{-3}(x) \left(\left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x)^2 a_{-3}(x)^2 + \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x)^2 a_{-3}(x)^2 + \left(\frac{d}{dx} a_{-1}(x) \right) r_{-2}(x)^3 a_{-0}(x) - \left(\frac{d}{dx} a_{-0}(x) \right) r_{-2}(x)^3 a_{-1}(x) + 3 r_{-0}(x)^2 \left(\frac{d}{dx} r_{-1}(x) \right) a_{-3}(x)^2 + r_{-0}(x)^2 r_{-2}(x) a_{-2}(x)^2 + 2 r_{-0}(x) \left(\frac{d}{dx} r_{-1}(x) \right)^2 a_{-3}(x)^2 + r_{-0}(x) r_{-2}(x)^2 a_{-1}(x)^2 - r_{-1}(x)^3 a_{-3}(x) a_{-0}(x) + 2 r_{-2}(x) \left(\frac{d}{dx} r_{-0}(x) \right)^2 a_{-3}(x)^2 - \left(\frac{d}{dx} a_{-3}(x) \right) \left(\frac{d}{dx} r_{-1}(x) \right) r_{-2}(x)^2 a_{-0}(x) + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-1}(x)^2 r_{-2}(x) a_{-0}(x) + \left(\frac{d}{dx} a_{-3}(x) \right) r_{-2}(x)^2 \left(\frac{d}{dx} r_{-0}(x) \right) a_{-1}(x) - \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x)^2 r_{-2}(x) a_{-3}(x) + \left(\frac{d}{dx} a_{-2}(x) \right) r_{-0}(x) r_{-2}(x)^2 a_{-1}(x) \right)
\end{aligned}$$

$$\begin{aligned}
& - \left(\frac{d}{dx} a_2(x) \right) r_1(x) r_2(x)^2 a_0(x) - \left(\frac{d}{dx} a_1(x) \right) r_0(x) r_2(x)^2 a_2(x) \\
& - \left(\frac{d}{dx} a_1(x) \right) r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) + \left(\frac{d}{dx} a_0(x) \right) r_0(x) r_2(x)^2 a_3(x) \\
& + \left(\frac{d}{dx} a_0(x) \right) \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_3(x) - \left(\frac{d}{dx} a_0(x) \right) r_1(x)^2 r_2(x) a_3(x) \\
& + \left(\frac{d}{dx} a_0(x) \right) r_1(x) r_2(x)^2 a_2(x) - r_0(x)^2 r_1(x) a_2(x) a_3(x) \\
& - 2 r_0(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_2(x) a_3(x) - 2 r_0(x)^2 r_2(x) a_3(x) a_1(x) \\
& + r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x)^2 + r_0(x) r_1(x)^2 a_3(x) a_1(x) \\
& - 3 r_0(x) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 + 2 r_0(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x) a_1(x) \\
& - 2 r_0(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - 2 r_0(x) r_2(x)^2 a_2(x) a_0(x) \\
& - 2 \left(\frac{d}{dx} r_1(x) \right) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - \left(\frac{d}{dx} r_1(x) \right) r_2(x)^2 a_2(x) a_0(x) - 3 r_1(x)^2 \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_0(x) \\
& + r_1(x)^2 r_2(x) a_2(x) a_0(x) + r_1(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) \\
& - 2 r_1(x) \left(\frac{d}{dx} r_2(x) \right)^2 a_3(x) a_0(x) - r_1(x) r_2(x)^2 a_1(x) a_0(x) \\
& - r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x)^2 + r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_1(x) \\
& - 3 r_2(x)^2 \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_0(x) + \left(\frac{d}{dx} a_3(x) \right) r_0(x)^2 r_2(x) a_2(x) \\
& - \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_2(x)^2 a_0(x) + r_0(x)^3 a_3(x)^2 + r_2(x)^3 a_0(x)^2 + \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_2(x) - \left(\frac{d}{dx} a_3(x) \right) r_0(x) r_1(x) r_2(x) a_1(x) - \left(\frac{d}{dx} a_3(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_0(x) - \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_1(x) + \left(\frac{d}{dx} a_3(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_0(x) - \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_0(x)
\end{aligned}$$

$$\begin{aligned}
& a_3(x) \Big) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_2(x) - \left(\frac{d}{dx} a_2(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x) a_3(x) + \left(\frac{d}{dx} a_2(x) \right) r_1(x) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) + \left(\frac{d}{dx} \right. \\
& a_1(x) \Big) r_0(x) r_1(x) r_2(x) a_3(x) + \left(\frac{d}{dx} a_1(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_3(x) - \left(\frac{d}{dx} a_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) \\
& - r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_1(x) a_2(x) a_3(x) - 2 r_0(x) \left(\frac{d}{dx} r_1(x) \right) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) a_2(x) a_3(x) - 3 r_0(x) \left(\frac{d}{dx} r_1(x) \right) r_2(x) a_3(x) a_1(x) \\
& + 3 r_0(x) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x) a_1(x) - r_0(x) r_1(x) r_2(x) a_2(x) a_1(x) \\
& + 3 r_0(x) r_1(x) r_2(x) a_3(x) a_0(x) - r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_2(x) a_1(x) \\
& + 3 r_0(x) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) + 2 r_0(x) r_2(x) \left(\frac{d}{dx} \right. \\
& r_0(x) \Big) a_2(x) a_3(x) + 3 \left(\frac{d}{dx} r_1(x) \right) r_1(x) r_2(x) a_3(x) a_0(x) + 2 \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) \left(\frac{d}{dx} r_2(x) \right) r_2(x) a_3(x) a_0(x) + r_1(x) \left(\frac{d}{dx} \right. \\
& r_2(x) \Big) r_2(x) a_2(x) a_0(x) + 2 r_1(x) \left(\frac{d}{dx} r_2(x) \right) \left(\frac{d}{dx} r_0(x) \right) a_2(x) a_3(x) \\
& - 2 \left(\frac{d}{dx} r_2(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x) a_1(x) + \left(\frac{d^2}{dx^2} r_2(x) \right) r_0(x) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) a_3(x)^2 - \left(\frac{d^2}{dx^2} r_2(x) \right) r_1(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& r_1(x) \Big) r_0(x) r_1(x) a_3(x)^2 - \left(\frac{d^2}{dx^2} r_1(x) \right) r_0(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 - \left(\frac{d^2}{dx^2} \right. \\
& r_1(x) \Big) r_2(x)^2 a_3(x) a_0(x) + \left(\frac{d^2}{dx^2} r_1(x) \right) r_2(x) \left(\frac{d}{dx} r_0(x) \right) a_3(x)^2 \\
& - \left(\frac{d^2}{dx^2} r_0(x) \right) r_0(x) r_2(x) a_3(x)^2 - \left(\frac{d^2}{dx^2} r_0(x) \right) \left(\frac{d}{dx} \right. \\
& r_1(x) \Big) r_2(x) a_3(x)^2 + \left(\frac{d^2}{dx^2} r_0(x) \right) r_1(x) \left(\frac{d}{dx} r_2(x) \right) a_3(x)^2 + \left(\frac{d^2}{dx^2} \right.
\end{aligned}$$

$$\left[\begin{aligned} & r_{-0}(x) \right) r_{-2}(x)^2 a_{-3}(x) a_{-1}(x) - \left(\frac{d^2}{dx^2} r_{-2}(x) \right) r_{-0}(x) r_{-2}(x) a_{-3}(x) a_{-1}(x) + \left(\frac{d^2}{dx^2} \right. \\ & r_{-2}(x) \left. \right) r_{-1}(x) r_{-2}(x) a_{-3}(x) a_{-0}(x) + \left(\frac{d^2}{dx^2} r_{-1}(x) \right) r_{-0}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \\ & \left. - \left(\frac{d^2}{dx^2} r_{-0}(x) \right) r_{-1}(x) r_{-2}(x) a_{-2}(x) a_{-3}(x) \right) \end{aligned} \right]$$

[> ##### EXAMPLES IN CHAPTER TWO #####

[In the section 2.2 called "Examples" we have the following Maple implementations:

$$\begin{aligned} & \text{> L02 := x^2*Dx^3+(x*b2+x*x*b1)*Dx^2+b2*b1*Dx-1;} \\ & \quad L02 := x^2 Dx^3 + (x b1 + x b2 + x) Dx^2 + b2 b1 Dx - 1 \end{aligned} \quad (22)$$

$$\begin{aligned} & \text{> L02:=subs({b1=1/7,b2=1/12},L02);} \\ & \quad L02 := x^2 Dx^3 + \frac{103}{84} x Dx^2 + \frac{1}{84} Dx - 1 \end{aligned} \quad (23)$$

$$\begin{aligned} & \text{> f:=2*(x-7)^2*(x-12)/(x-3)^2;} \\ & \quad f := \frac{2 (x-7)^2 (x-12)}{(x-3)^2} \end{aligned} \quad (24)$$

$$\begin{aligned} & \text{> L:=ChangeOfVariables(L02,f);} \\ & \quad L := 84 Dx^3 (x-7)^2 (x-12)^2 (x-3)^5 (x^2 - 2x - 75)^2 + (103 x^4 - 412 x^3 - 59390 x^2 \\ & \quad + 913908 x - 3630033) Dx^2 (x-7) (x-12) (x-3)^4 (x^2 - 2x - 75) + (x^8 - 8 x^7 \\ & \quad + 25948 x^6 - 1451784 x^5 + 34550774 x^4 - 458049624 x^3 + 3589905852 x^2 \\ & \quad - 15576038424 x + 28661695857) Dx (x-3)^3 - 168 (x^2 - 2x - 75)^5 (x-7) \end{aligned} \quad (25)$$

$$\begin{aligned} & \text{> L12 := x^2*Dx^3+(x*b2+x*x*b1)*Dx^2+(b2*b1-x)*Dx-a1;} \\ & \quad L12 := x^2 Dx^3 + (x b1 + x b2 + x) Dx^2 + (b2 b1 - x) Dx - a1 \end{aligned} \quad (26)$$

$$\begin{aligned} & \text{> L12:=subs({a1=1/3,b1=1/5,b2=1/9},L12);} \\ & \quad L12 := x^2 Dx^3 + \frac{59 x Dx^2}{45} + \left(-x + \frac{1}{45} \right) Dx - \frac{1}{3} \end{aligned} \quad (27)$$

$$\begin{aligned} & \text{> r:=(x-5)*(x-9);} \\ & \quad r := (x-5) (x-9) \end{aligned} \quad (28)$$

$$\begin{aligned} & \text{> L:=ExpProduct(L12,r);} \\ & \quad L := 45 x^2 Dx^3 - (135 x^3 - 1890 x^2 + 6075 x - 59) Dx^2 x + (135 x^6 - 3780 x^5 + 38610 x^4 \\ & \quad - 170488 x^3 + 276917 x^2 - 5355 x + 1) Dx - 45 x^8 + 1890 x^7 - 32535 x^6 + 293909 x^5 \\ & \quad - 1471397 x^4 + 3882779 x^3 - 4260854 x^2 + 122340 x - 60 \end{aligned} \quad (29)$$

$$\begin{aligned}
& \text{> L22} := x^2 Dx^3 + (-x^2 + x b2 + x + x b1) Dx^2 + (-x a1 - x a2 + b2 b1 - x) Dx - a1 a2; \\
& \quad L22 := x^2 Dx^3 + (x b1 + x b2 - x^2 + x) Dx^2 + (-x a1 - x a2 + b2 b1 - x) Dx - a1 a2 \quad (30) \\
& \text{> L22:=subs}(\{a1=1/7, a2=1/3, b1=1/2, b2=1/4\}, L22); \\
& \quad L22 := x^2 Dx^3 + \left(-x^2 + \frac{7}{4} x\right) Dx^2 + \left(-\frac{31x}{21} + \frac{1}{8}\right) Dx - \frac{1}{21} \quad (31) \\
& \text{> r0:=x+1;} \\
& \quad r0 := x + 1 \quad (32) \\
& \text{> r1:=0;} \\
& \quad r1 := 0 \quad (33) \\
& \text{> r2:=x^3;} \\
& \quad r2 := x^3 \quad (34) \\
& \text{> L:=GaugeTransf(L22,r0,r1,r2);} \\
& \quad L := 168 Dx^3 x^2 (47424 x^5 + 97456 x^4 + 128919 x^3 + 180789 x^2 + 86436 x + 28224) \\
& \quad - 42 (189696 x^6 + 1006336 x^5 + 1392780 x^4 + 1367751 x^3 + 526533 x^2 - 146412 x \\
& \quad - 197568) Dx^2 x + (4173312 x^6 + 48970048 x^5 + 28542024 x^4 - 73928001 x^3 \\
& \quad - 78087429 x^2 - 19261116 x + 592704) Dx - 4552704 x^5 - 44657216 x^4 + 16950528 x^3 \\
& \quad + 56356881 x^2 + 18202716 x - 818496 \quad (35)
\end{aligned}$$

> ##### RELATION BETWEEN EXP-PRODUCT TRANSFORMATION
AND GENERALIZED EXPONENTS #####

In the section 2.4.1 called "Relation between Exp-product Transformation and Generalized Exponents"
we have the following Maple implementations:

$$\begin{aligned}
& \text{> L02} := x^2 Dx^3 + (x b2 + x + x b1) Dx^2 + b2 b1 Dx - 1; \\
& \quad L02 := x^2 Dx^3 + (x b1 + x b2 + x) Dx^2 + b2 b1 Dx - 1 \quad (36) \\
& \text{> L02:=subs}(\{b1=1/7, b2=1/12\}, L02); \\
& \quad L02 := x^2 Dx^3 + \frac{103}{84} x Dx^2 + \frac{1}{84} Dx - 1 \quad (37) \\
& \text{> r:=2*(x-7)^2*(x-12)/(x-3)^5;} \\
& \quad r := \frac{2(x-7)^2(x-12)}{(x-3)^5} \quad (38) \\
& \text{> M:=ExpProduct(L02,r);} \\
& \quad M := 84 Dx^3 (x-3)^{15} x^2 + (103 x^5 - 2049 x^4 + 22374 x^3 - 137178 x^2 + 338067 x \\
& \quad - 25029) Dx^2 (x-3)^{10} x + (x^{10} + 566 x^9 - 28567 x^8 + 487772 x^7 - 3652074 x^6 \\
& \quad + 9698904 x^5 + 24950142 x^4 - 208055196 x^3 + 375197913 x^2 - 59065038 x + 59049) \\
& \quad Dx (x-3)^5 - 84 x^{15} + 3780 x^{14} - 79978 x^{13} + 1072646 x^{12} - 10331242 x^{11} \\
& \quad + 74779638 x^{10} - 397629208 x^9 + 1406479312 x^8 - 2375858712 x^7 - 3323132640 x^6 \\
& \quad + 24916159254 x^5 - 35687858634 x^4 - 31060507050 x^3 + 106513839270 x^2 \quad (39)
\end{aligned}$$

$$\begin{aligned}
& -31616942868x + 1274749812 \\
& \text{> gen_exp(L02,t,x=0);} \\
& \quad \left[[0, t=x], \left[\frac{11}{12}, t=x \right], \left[\frac{6}{7}, t=x \right] \right] \quad (40) \\
& \text{> gen_exp(M,t,x=0);} \\
& \quad \left[[0, t=x], \left[\frac{11}{12}, t=x \right], \left[\frac{6}{7}, t=x \right] \right] \quad (41) \\
& \text{> gen_exp(L02,t,x=infinity);} \\
& \quad \left[\left[\frac{1}{t} - \frac{65}{252}, -t^3 = \frac{1}{x} \right] \right] \quad (42) \\
& \text{> gen_exp(M,t,x=infinity);} \\
& \quad \left[\left[\frac{1}{t} - \frac{65}{252}, -t^3 = \frac{1}{x} \right] \right] \quad (43) \\
& \text{> series(r,x=infinity,6);} \\
& \quad \frac{2}{x^2} + O\left(\frac{1}{x^3}\right) \quad (44) \\
& \text{> gen_exp(L02,t,x=3);} \\
& \quad [[0, 1, 2, t=x-3]] \quad (45) \\
& \text{> gen_exp(M,t,x=3);} \\
& \quad \left[\left[\frac{2}{t} - \frac{34}{t^2} + \frac{176}{t^3} - \frac{288}{t^4}, 1 + \frac{2}{t} - \frac{34}{t^2} + \frac{176}{t^3} - \frac{288}{t^4}, 2 + \frac{2}{t} - \frac{34}{t^2} + \frac{176}{t^3} - \frac{288}{t^4}, \right. \right. \quad (46) \\
& \quad \left. \left. t=x-3 \right] \right] \\
& \text{> series(r,x=3);} \\
& \quad (-288)(x-3)^{-5} + 176(x-3)^{-4} - 34(x-3)^{-3} + 2(x-3)^{-2} \quad (47)
\end{aligned}$$

$$\begin{aligned}
& \text{> L02 := x^2*Dx^3+(x*b2+x*x*b1)*Dx^2+b2*b1*Dx-1;} \\
& \quad L02 := x^2 Dx^3 + (x b1 + x b2 + x) Dx^2 + b2 b1 Dx - 1 \quad (48) \\
& \text{> L02:=subs({b1=1/7,b2=1/12},L02);} \\
& \quad L02 := x^2 Dx^3 + \frac{103}{84} x Dx^2 + \frac{1}{84} Dx - 1 \quad (49) \\
& \text{> r:=(x-5)*(x-9);} \\
& \quad r := (x-5)(x-9) \quad (50) \\
& \text{> M:=ExpProduct(L02,r);} \\
& \quad M := 84x^2 Dx^3 - (252x^3 - 3528x^2 + 11340x - 103) Dx^2 x + (252x^6 - 7056x^5 + 72072x^4 \\
& \quad - 318230x^3 + 516712x^2 - 9270x + 1) Dx - 84x^8 + 3528x^7 - 60732x^6 + 548623x^5 \\
& \quad - 2746408x^4 + 7245730x^3 - 7943415x^2 + 210031x - 129 \quad (51) \\
& \text{> gen_exp(L02,t,x=infinity);} \\
& \quad \left[\left[\frac{1}{t} - \frac{65}{252}, -t^3 = \frac{1}{x} \right] \right] \quad (52) \\
& \text{> gen_exp(M,t,x=infinity);} \\
& \quad \quad \quad (53)
\end{aligned}$$

$$\left[\left[\frac{1}{t} - \frac{65}{252} + \frac{45}{t^3} + \frac{14}{t^6} + \frac{1}{t^9}, -t^3 = \frac{1}{x} \right] \right] \quad (53)$$

> series(r,x=infinity);

$$x^2 - 14x + 45 \quad (54)$$

> ##### RELATION BETWEEN GAUGE TRANSFORMATION AND
GENERALIZED EXPONENTS #####

In the section 2.4.2 called "Relation between Gauge Transformation and Generalized Exponents" we have the following Maple implementations:

> L12 := x^2*Dx^3+(x*b2+x*x*b1)*Dx^2+(b2*b1-x)*Dx-a1;

$$L12 := x^2 Dx^3 + (x b1 + x b2 + x) Dx^2 + (b2 b1 - x) Dx - a1 \quad (55)$$

> L12:=subs({a1=1/3,b1=1/7,b2=1/12},L12);

$$L12 := x^2 Dx^3 + \frac{103 x Dx^2}{84} + \left(-x + \frac{1}{84} \right) Dx - \frac{1}{3} \quad (56)$$

> r0:=3/x;

$$r0 := \frac{3}{x} \quad (57)$$

> r1:=x/(x-7);

$$r1 := \frac{x}{x-7} \quad (58)$$

> r2:=x-7;

$$r2 := x - 7 \quad (59)$$

> M:=GaugeTransf(L12,r0,r1,r2);

$$M := 84 x^3 (x-7)^2 (3136 x^7 - 111540 x^6 + 1392971 x^5 - 8333700 x^4 + 25678226 x^3 - 41548815 x^2 + 23237221 x - 7203)^2 Dx^3 + x^2 (x-7) (586432 x^8 - 28800460 x^7 + 509339525 x^6 - 4662826391 x^5 + 24338525498 x^4 - 73931725427 x^3 + 119305724986 x^2 - 71413562458 x + 26370183) (3136 x^7 - 111540 x^6 + 1392971 x^5 - 8333700 x^4 + 25678226 x^3 - 41548815 x^2 + 23237221 x - 7203) Dx^2 - (263424 x^9 - 11479888 x^8 + 183592764 x^7 - 1459490217 x^6 + 6318707179 x^5 - 17720074414 x^4 + 47339861282 x^3 - 83411349511 x^2 + 60723371667 x - 32571966) Dx x (x - 7) (3136 x^7 - 111540 x^6 + 1392971 x^5 - 8333700 x^4 + 25678226 x^3 - 41548815 x^2 + 23237221 x - 7203) - (x-7) (3136 x^7 - 111540 x^6 + 1392971 x^5 - 8333700 x^4 + 25678226 x^3 - 41548815 x^2 + 23237221 x - 7203) (351232 x^9 - 16474192 x^8 + 282884020 x^7 - 2375806663 x^6 + 10269651297 x^5 - 23298427278 x^4 + 30364284328 x^3 - 18044832463 x^2 - 341328561 x - 5243784) \quad (60)$$

> gen_exp(L12,t,x=0);

$$\left[[0, t=x], \left[\frac{11}{12}, t=x \right], \left[\frac{6}{7}, t=x \right] \right] \quad (61)$$

$$\begin{aligned} &> \text{gen_exp}(M, t, x=0); \\ &\quad \left[[-1, t=x], \left[-\frac{8}{7}, t=x \right], \left[-\frac{13}{12}, t=x \right] \right] \end{aligned} \quad (62)$$

$$\begin{aligned} &> \text{gen_exp}(L12, t, x=\text{infinity}); \\ &\quad \left[\left[\frac{1}{3}, t = \frac{1}{x} \right], \left[\frac{1}{t} - \frac{17}{56}, t^2 = \frac{1}{x} \right] \right] \end{aligned} \quad (63)$$

$$\begin{aligned} &> \text{gen_exp}(M, t, x=\text{infinity}); \\ &\quad \left[\left[\frac{4}{3}, t = \frac{1}{x} \right], \left[\frac{1}{t} - \frac{17}{56}, t^2 = \frac{1}{x} \right] \right] \end{aligned} \quad (64)$$

$$\begin{aligned} &> \text{gen_exp}(L12, t, x=7); \\ &\quad [[0, 1, 2, t=x-7]] \end{aligned} \quad (65)$$

$$\begin{aligned} &> \text{gen_exp}(M, t, x=7); \\ &\quad [[-1, 0, 1, t=x-7]] \end{aligned} \quad (66)$$

$$\begin{aligned} &> \text{gen_exp}(L12, t, x=1); \\ &\quad [[0, 1, 2, t=x-1]] \end{aligned} \quad (67)$$

$$\begin{aligned} &> \text{gen_exp}(M, t, x=1); \\ &\quad [[0, 1, 2, t=x-1]] \end{aligned} \quad (68)$$

RELATION BETWEEN CHANGE OF VARIABLE TRANSFORMATION AND GENERALIZED EXPONENTS

In the section 2.4.3 called "Relation between Change of Variable Transformation and Generalized Exponents" we have the following Maple implementations:

$$\begin{aligned} &> \text{LBB} := 2*x^2*Dx^3 + 6*x*Dx^2 + (2-2*x-2*nu^2)*Dx-1; \\ &\quad LBB := 2x^2Dx^3 + 6xDx^2 + (-2v^2 - 2x + 2)Dx - 1 \end{aligned} \quad (69)$$

$$\begin{aligned} &> \text{LBB} := \text{subs}(nu=3, LBB); \\ &\quad LBB := 2x^2Dx^3 + 6xDx^2 + (-2x - 16)Dx - 1 \end{aligned} \quad (70)$$

$$\begin{aligned} &> \text{gen_exp}(LBB, t, x=0); \\ &\quad [[-3, 0, 3, t=x]] \end{aligned} \quad (71)$$

$$\begin{aligned} &> \text{gen_exp}(LBB, t, x=\text{infinity}); \\ &\quad \left[\left[\frac{1}{2}, t = \frac{1}{x} \right], \left[\frac{1}{t} + \frac{1}{2}, t^2 = \frac{1}{x} \right] \right] \end{aligned} \quad (72)$$

$$\begin{aligned} &> f := (x-1)^8*x^6/(x-12)^10; \\ &\quad f := \frac{(x-1)^8x^6}{(x-12)^{10}} \end{aligned} \quad (73)$$

$$\begin{aligned} &> M := \text{ChangeOfVariables}(LBB, f); \\ M &:= Dx^3 (x-1)^2 x^2 (x-12)^{13} (x^2 - 41x + 18)^2 + 3 (x^4 - 82x^3 + 575x^2 - 468x \\ &\quad + 216) Dx^2 (x-1) x (x-12)^{12} (x^2 - 41x + 18) - (16x^{22} - 2752x^{21} + 183968x^{20} \\ &\quad - 5927232x^{19} + 92172927x^{18} - 627170724x^{17} + 2409383746x^{16} - 6314702496x^{15} \\ &\quad + 30279851895x^{14} - 744912611952x^{13} + 19429306967672x^{12} - 384289295082784x^{11} \\ &\quad + 5730368146930000x^{10} - 64409641148306304x^9 + 541073854638635904x^8 \end{aligned} \quad (74)$$

$$\begin{aligned}
& - 3332740360025590272 x^7 + 14553041176441463040 x^6 - 42594780648286715904 x^5 \\
& + 76208058878030512128 x^4 - 72791577911076323328 x^3 + 36716049153820459008 x^2 \\
& - 9299742418343559168 x + 933087744110886912) Dx (x - 12) - 32 (x \\
& - 1)^7 x^5 (x^2 - 41 x + 18)^5
\end{aligned}$$

> series(f,x=0,9);

$$\frac{1}{61917364224} x^6 - \frac{43}{371504185344} x^7 + \frac{3127}{8916100448256} x^8 + O(x^9) \quad (75)$$

> gen_exp(M,t,x=0);

$$[[-18, 0, 18, t=x]] \quad (76)$$

> series(f,x=1,10);

$$\frac{1}{25937424601} (x-1)^8 + \frac{76}{285311670611} (x-1)^9 + O((x-1)^{10}) \quad (77)$$

> gen_exp(M,t,x=1);

$$[[-24, 0, 24, t=x-1]] \quad (78)$$

> series(f,x=12);

$$\begin{aligned}
& 640072188923904 (x-12)^{-10} + 785543140952064 (x-12)^{-9} + 447543588019968 (x \\
& - 12)^{-8} + 156886659198720 (x-12)^{-7} + 37804890836592 (x-12)^{-6} \\
& + 6624387287496 (x-12)^{-5} + O((x-12)^{-4})
\end{aligned} \quad (79)$$

> series((f*(x-12)^10)^(1/2),x=12);

$$\begin{aligned}
& 25299648 + 15524784 (x-12) + 4081572 (x-12)^2 + 595969 (x-12)^3 + 52196 (x-12)^4 \\
& + 2742 (x-12)^5 + O((x-12)^6)
\end{aligned} \quad (80)$$

> gen_exp(M,t,x=12);

$$\begin{aligned}
& \left[[5, t=x-12], \left[\frac{252996480}{t^5} + \frac{124198272}{t^4} + \frac{24489432}{t^3} + \frac{2383876}{t^2} + \frac{104392}{t} + 5, t \right. \right. \\
& \left. \left. = x-12 \right], \left[-\frac{252996480}{t^5} - \frac{124198272}{t^4} - \frac{24489432}{t^3} - \frac{2383876}{t^2} - \frac{104392}{t} + 5, t \right. \right. \\
& \left. \left. = x-12 \right] \right]
\end{aligned} \quad (81)$$

> series(f,x=infinity);

$$\begin{aligned}
& x^4 + 112 x^3 + 6988 x^2 + 320104 x + 12000070 + \frac{389761048}{x} + \frac{11353950076}{x^2} \\
& + \frac{303501512344}{x^3} + \frac{7565103474817}{x^4} + \frac{177920465247480}{x^5} + O\left(\frac{1}{x^6}\right)
\end{aligned} \quad (82)$$

> series((f*(1/x)^4)^(1/2),x=infinity,5);

$$1 + \frac{56}{x} + \frac{1926}{x^2} + \frac{52196}{x^3} + \frac{1222321}{x^4} + O\left(\frac{1}{x^5}\right) \quad (83)$$

> gen_exp(M,t,x=infinity);

$$\left[\left[2, t = \frac{1}{x} \right], \left[\frac{4}{t^2} + \frac{112}{t} + 2, t = \frac{1}{x} \right], \left[-\frac{4}{t^2} - \frac{112}{t} + 2, t = \frac{1}{x} \right] \right] \quad (84)$$

$$\begin{aligned} &> \text{LBB} := 2 * x^2 * Dx^3 + 6 * x * Dx^2 + (2 - 2 * x - 2 * nu^2) * Dx - 1; \\ &\quad \text{LBB} := 2 x^2 Dx^3 + 6 x Dx^2 + (-2 v^2 - 2 x + 2) Dx - 1 \end{aligned} \quad (85)$$

$$\begin{aligned} &> \text{LBB} := \text{subs}(nu=3, \text{LBB}); \\ &\quad \text{LBB} := 2 x^2 Dx^3 + 6 x Dx^2 + (-2 x - 16) Dx - 1 \end{aligned} \quad (86)$$

$$\begin{aligned} &> \text{gen_exp}(\text{LBB}, t, x=0); \\ &\quad [[-3, 0, 3, t=x]] \end{aligned} \quad (87)$$

$$\begin{aligned} &> \text{gen_exp}(\text{LBB}, t, x=\text{infinity}); \\ &\quad \left[\left[\frac{1}{2}, t = \frac{1}{x} \right], \left[\frac{1}{t} + \frac{1}{2}, t^2 = \frac{1}{x} \right] \right] \end{aligned} \quad (88)$$

$$\begin{aligned} &> f := (x-3)^2 / x^{10}; \\ &\quad f := \frac{(x-3)^2}{x^{10}} \end{aligned} \quad (89)$$

$$\begin{aligned} &> M := \text{ChangeOfVariables}(\text{LBB}, f); \\ M &:= Dx^3 x^{13} (x-3)^2 (4x-15)^2 + 3 (4x^2 - 30x + 45) Dx^2 x^{12} (x-3) (4x-15) \\ &\quad - (9200 x^{14} - 138000 x^{13} + 776250 x^{12} - 1941030 x^{11} + 1820475 x^{10} + 1024 x^6 \\ &\quad - 21504 x^5 + 187776 x^4 - 872640 x^3 + 2276100 x^2 - 3159000 x + 1822500) Dx x \\ &\quad + 4 (4x-15)^5 (x-3) \end{aligned} \quad (90)$$

$$\begin{aligned} &> \text{series}(f, x=3); \\ &\quad \frac{1}{59049} (x-3)^2 - \frac{10}{177147} (x-3)^3 + \frac{55}{531441} (x-3)^4 - \frac{220}{1594323} (x-3)^5 + O((x \\ &\quad - 3)^6) \end{aligned} \quad (91)$$

$$\begin{aligned} &> \text{gen_exp}(M, t, x=3); \\ &\quad [[-6, 0, 6, t=x-3]] \end{aligned} \quad (92)$$

$$\begin{aligned} &> \text{series}(f, x=\text{infinity}, 12); \\ &\quad \frac{1}{x^8} - \frac{6}{x^9} + \frac{9}{x^{10}} \end{aligned} \quad (93)$$

$$\begin{aligned} &> \text{gen_exp}(M, t, x=\text{infinity}); \\ &\quad \left[\left[-24, 0, 24, t = \frac{1}{x} \right] \right] \end{aligned} \quad (94)$$

$$\begin{aligned} &> \text{series}(f, x=0); \\ &\quad 9 x^{-10} - 6 x^{-9} + x^{-8} \end{aligned} \quad (95)$$

$$\begin{aligned} &> \text{series}((f * x^{10})^{(1/2)}, x=0); \\ &\quad 3 - x + O(x^6) \end{aligned} \quad (96)$$

$$\begin{aligned} &> \text{gen_exp}(M, t, x=0); \\ &\quad \left[[5, t=x], \left[\frac{30}{t^5} - \frac{8}{t^4} + 5, t=x \right], \left[-\frac{30}{t^5} + \frac{8}{t^4} + 5, t=x \right] \right] \end{aligned} \quad (97)$$