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[ > restart;
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[ > read "qsum13.mpl";
```

Package "q-Hypergeometric Summation", Maple V-13

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[ Equation (87), Theorem 19, Askey-Wilson
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```
[ > RE:=4*q^n*q*(q^(k+1)-1)*(a^2*q^(k+1)-1)*(a*c*q^(k+1)-1)*(a*d*q^(k+1)-1)*(q*q^(k+1)-1)*(a*b*q^(k+1)-1)*A(k+2)+4*(q^(k+1)-1)*(-(q^(k+1))^3*a^3*q^n*b*c*d-(q^(k+1))^3*a^3*q*q^n*b*c*d+(q^(k+1))^2*q^n*a*b*c*d*q+(q^(k+1))^2*a^2*q*q^n*b*c+(q^(k+1))^2*a^3*q*(q^n)^2*b*c*d+(q^(k+1))^2*q^2*a^2+(q^(k+1))^2*a^2*q*q^n*c*d+(q^(k+1))^2*a^2*q*q^n*b*d-q^(k+1)*q^2-q^(k+1)*q*(q^n)^2*a*b*c*d-q^(k+1)*a^2*q^2*q^n-q^(k+1)*a*q^2*q^n*c-q^(k+1)*a*q^2*q^n*d-q^(k+1)*a*q^2*q^n*b+q^3*q^n+q^2*q^n)*A(k+1)-4*(q^n*q-q^(k+1))*q*(q^(k+1)*a*b*c*d*q^n-q^2)*A(k) = 0;
```

$$RE := 4 q^n q (q^{(k+1)} - 1) (a^2 q^{(k+1)} - 1) (a c q^{(k+1)} - 1) (a d q^{(k+1)} - 1) (q q^{(k+1)} - 1) (a b q^{(k+1)} - 1) A(k+2) + 4 (q^{(k+1)} - 1) (-(q^{(k+1)})^3 a^3 q^n b c d - (q^{(k+1)})^3 a^3 q q^n b c d + (q^{(k+1)})^2 q^n a b c d q + (q^{(k+1)})^2 a^2 q q^n b c + (q^{(k+1)})^2 a^3 q (q^n)^2 b c d + (q^{(k+1)})^2 q^2 a^2 + (q^{(k+1)})^2 a^2 q q^n c d + (q^{(k+1)})^2 a^2 q q^n b d - q^{(k+1)} q^2 - q^{(k+1)} q (q^n)^2 a b c d - q^{(k+1)} a^2 q^2 q^n - q^{(k+1)} a q^2 q^n c - q^{(k+1)} a q^2 q^n d - q^{(k+1)} a q^2 q^n b + q^3 q^n + q^2 q^n) A(k+1) - 4 (q^n q - q^{(k+1)}) q (q^{(k+1)} a b c d q^n - q^2) A(k) = 0$$

```
[ > TIME:=time();
```

```
qrecsolve(RE,q,A(k),output=qhypergeometric);
```

```
time()-TIME;
```

```
[[qpochhammer(q^(-n), q, k) qpochhammer(a b c d q^(n-1), q, k) q^k / (qpochhammer(a c, q, k) qpochhammer(a d, q, k) qpochhammer(q, q, k) qpochhammer(a b, q, k)), 0 ≤ k]]
```

4.750

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[ >
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