■ Summenformeln

In[1]:=
$$\sum_{k=1}^{n} k$$

Out[1]=
$$\frac{1}{2} n (n+1)$$

In[2]:=
$$\sum_{k=1}^{n} k^2$$

Out[2]=
$$\frac{1}{6} n (n+1) (2n+1)$$

In[3]:=
$$\sum_{k=1}^{n} k^3$$

Out[3]=
$$\frac{1}{4} n^2 (n+1)^2$$

In[4]:=
$$\sum_{k=0}^{n} q^k$$

Out[4]=
$$\frac{q^{n+1} - 1}{q - 1}$$

■ Komplexe Zahlen

In[5]:=
```
1 + i
-----
1 - i
```

Out[5]= i

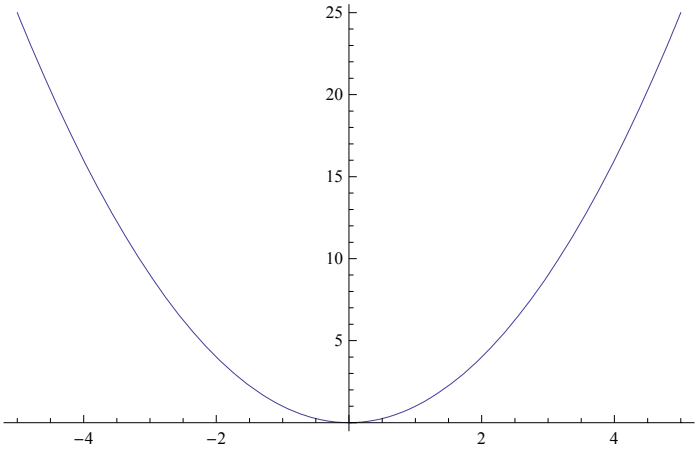
In[6]:=
```
Solve[x^2 + 2 x + 5 == 0, x]
```

Out[6]= $\{\{x \to -1 - 2\,i\}, \{x \to -1 + 2\,i\}\}$

■ Betrag und Ungleichungen

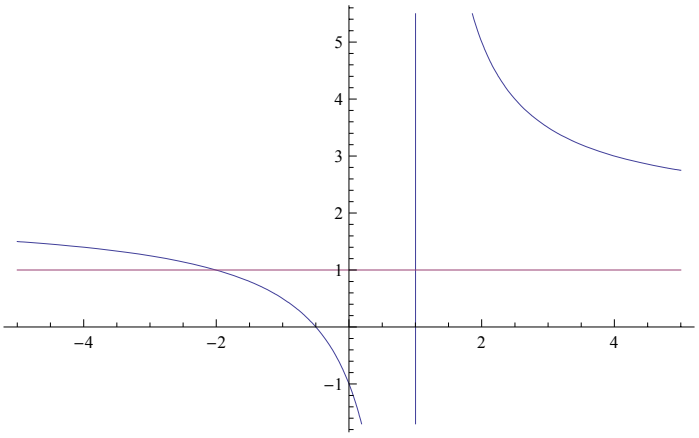
In[7]:=
```
Plot[x^2, {x, -5, 5}]
```

Out[7]=



In[8]:=
```
Plot[{(2 x + 1)/(x - 1), 1}, {x, -5, 5}]
```

Out[8]=

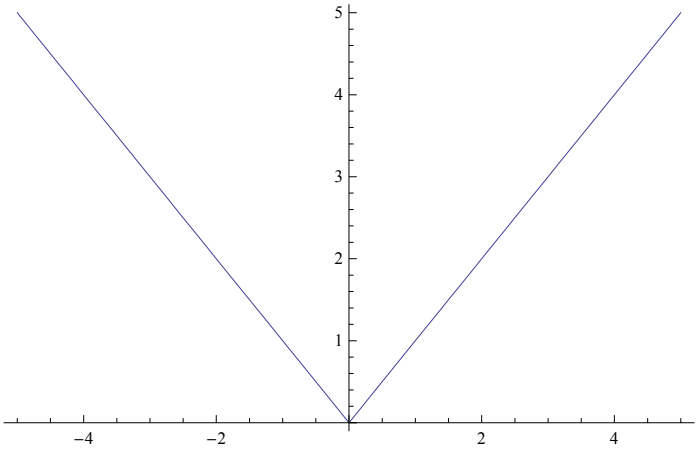


In[9]:=
```
Reduce[(2 x + 1)/(x - 1) < 1]
```

Out[9]= $-2 < x < 1$

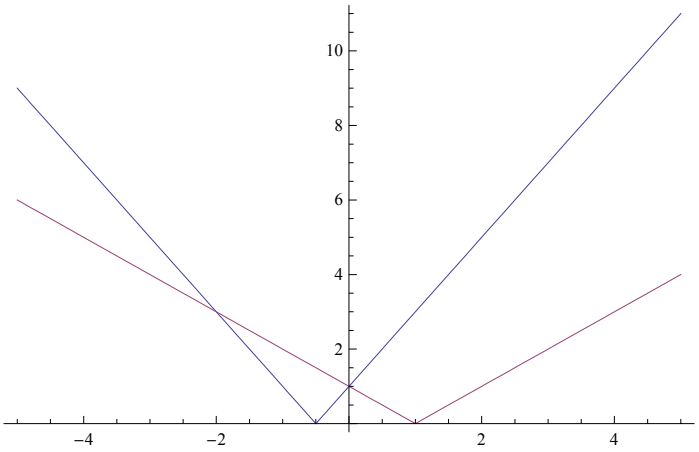
In[10]:=
```
Plot[Abs[x], {x, -5, 5}]
```

Out[10]=



In[11]:=
```
Plot[{Abs[2 x + 1], Abs[x - 1]}, {x, -5, 5}]
```

Out[11]=



In[12]:=
```
Reduce[Abs[2 x + 1] ≤ Abs[x - 1], x]
```

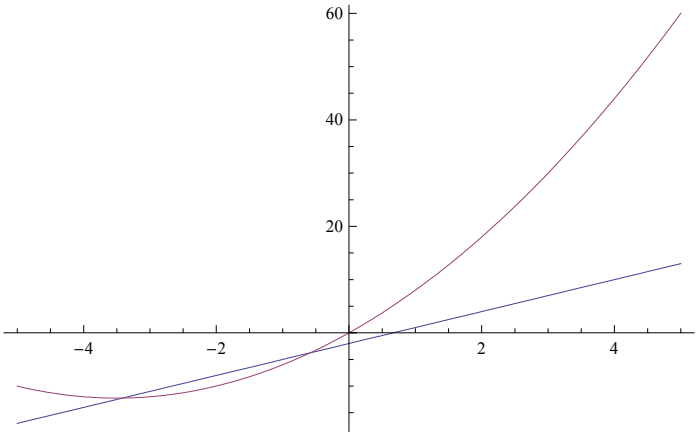
Out[12]= $x == -2 \bigvee \left(-2 < \text{Re}(x) < 0 \bigwedge -\sqrt{-\text{Re}(x)^2 - 2\,\text{Re}(x)} \le \text{Im}(x) \le \sqrt{-\text{Re}(x)^2 - 2\,\text{Re}(x)}\right) \bigvee x == 0$

In[13]:=
```
Reduce[Abs[2 x + 1] ≤ Abs[x - 1] && Im[x] == 0, x]
```

Out[13]= $-2 \le x \le 0$

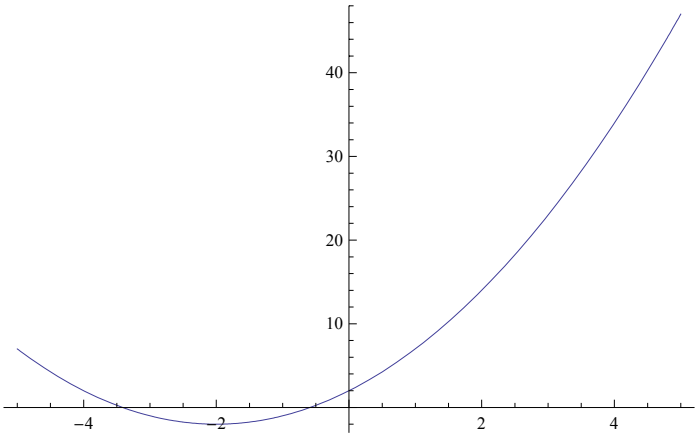
In[14]:=
```
Plot[{3 x - 2, x^2 + 7 x}, {x, -5, 5}]
```

Out[14]=



In[15]:=
```
Plot[x^2 + 7 x - (3 x - 2), {x, -5, 5}]
```

Out[15]=



■ Binomischer Satz

In[16]:=
```
Sum[Binomial[n, k] a^k b^(n-k), {k, 0, n}]
```

Out[16]= $(a + b)^n$

In[17]:=
```
Sum[Binomial[n, k], {k, 0, n}]
```

Out[17]= 2^n

In[18]:=
```
Sum[Binomial[k + j, j], {j, 0, n}]
```

Out[18]= $\binom{k + n + 1}{n}$