Seminar

'Typ 1 Aufgaben qualitätsvoll erstellen'

1. Bilder einfügen

2. Erstellen von GeoGebra Grafiken

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2. Erstellen von GeoGebra Grafiken

Bilder einfügen

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```
\includegraphics[width=0.5\textwidth]{Grafik.jpg}
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Wichtig:

Die Bilder müssen in dem selben Ordner liegen wie die `.tex`-Datei (oder der Dateipfad muss angegeben werden)

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- Mit $\boxed{\LaTeX \Rightarrow \text{PDF}}$:

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  Einfügen von Standard-Grafikformaten möglich

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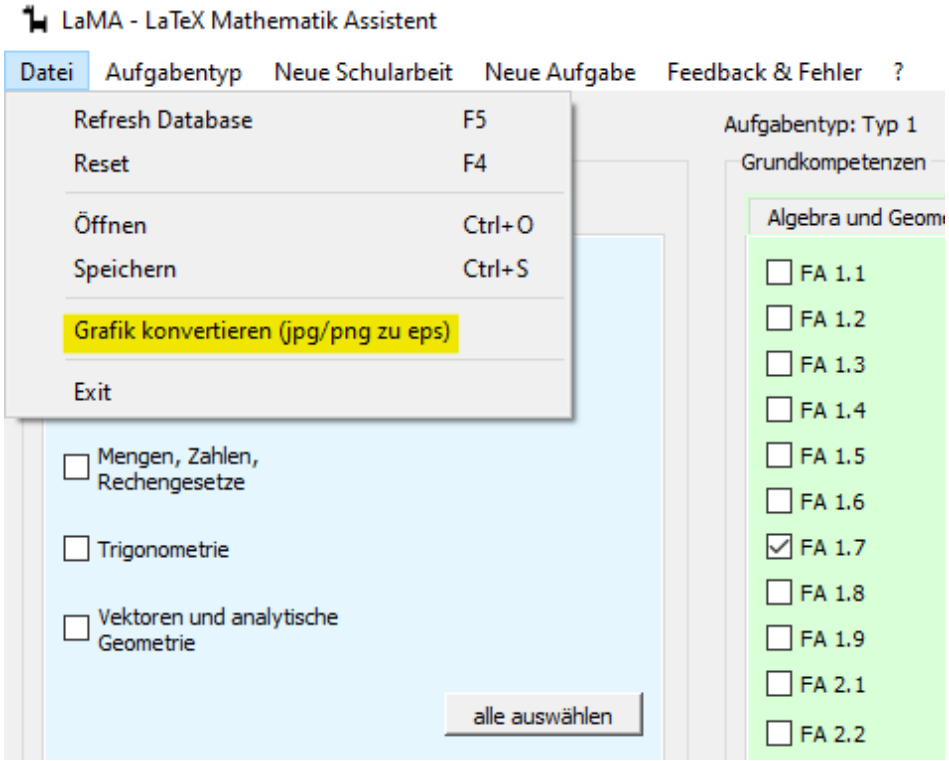
  Einbetten von Geogebra-Grafiken möglich
- Aber: Bilder müssen in das `.eps` Format konvertiert werden! (z.B. mit LaMA)

Bilder konvertieren

LaMA kann .jpg und .png zu .eps konvertieren



Erstellen von GeoGebra Grafiken

GeoGebra Grafiken einbinden – Vorgehensweise

- Grafik in GeoGebra erstellen (GeoGebra 5)

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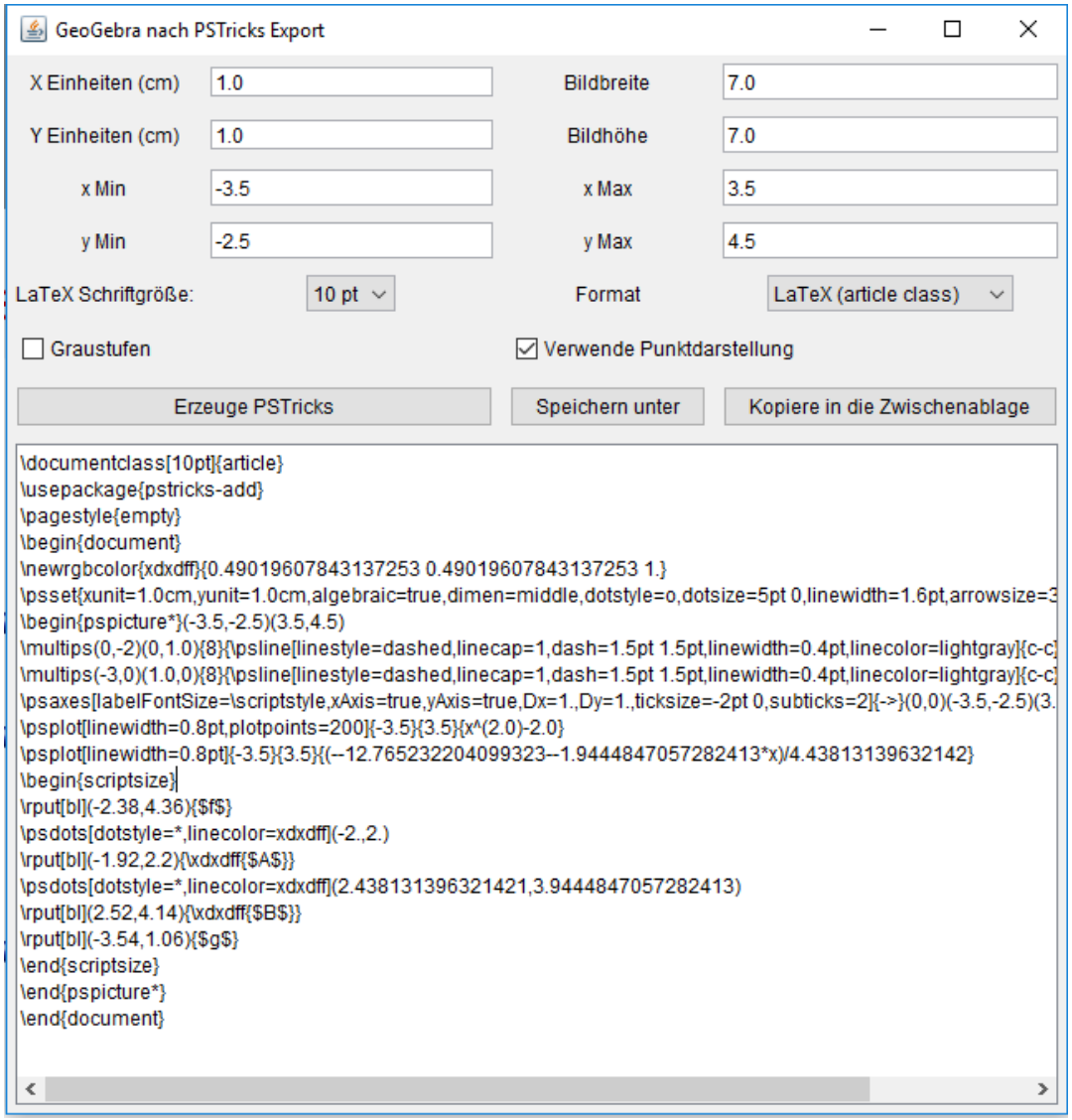
- ev. Bildgröße anpassen und Erzeuge PSTricks
- Code zwischen

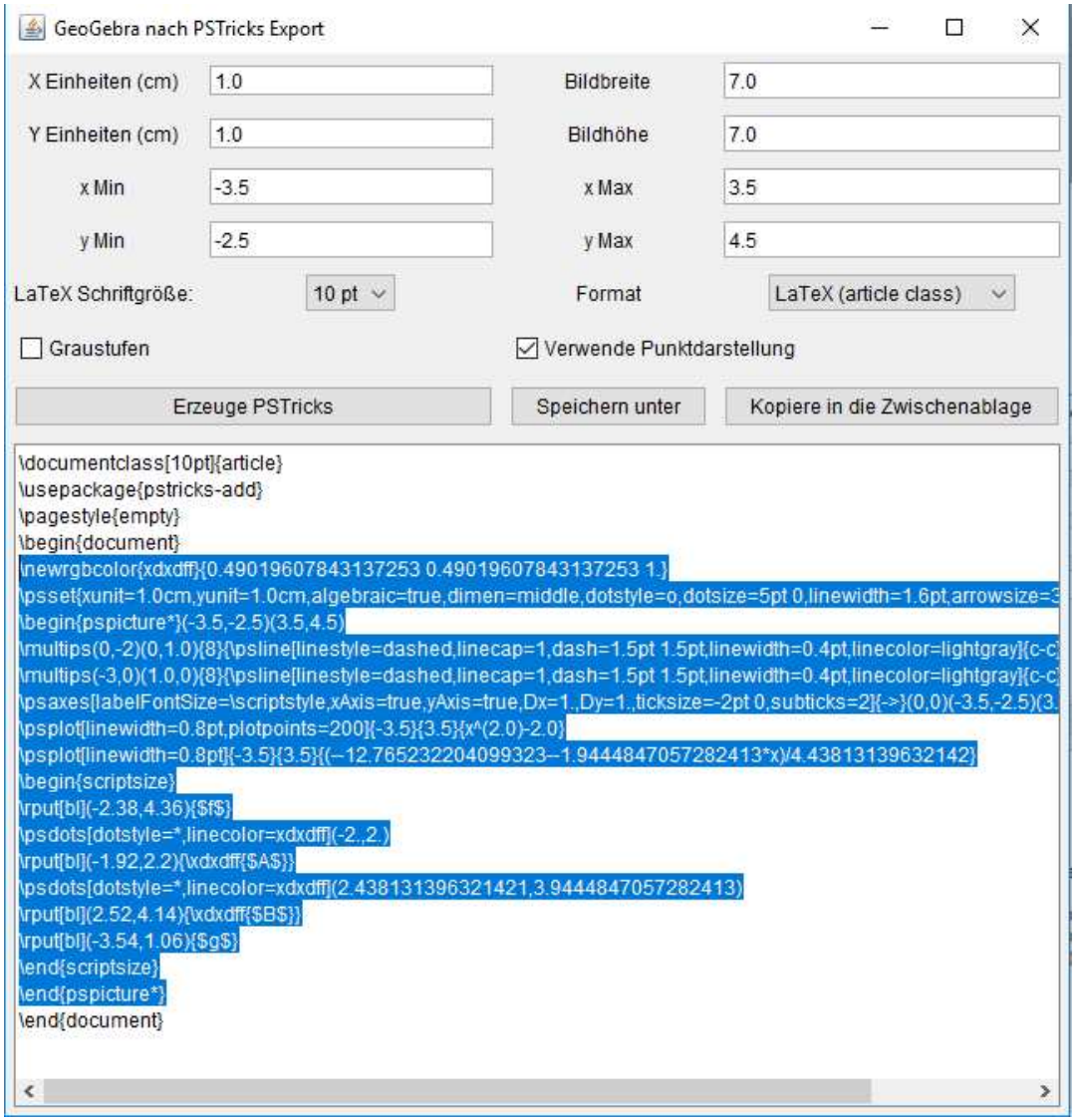
  `\begin{document}` ... `\end{document}`

  kopieren

Erstellen von GeoGebra Grafiken



Erstellen von GeoGebra Grafiken



Erstellen von GeoGebra Grafiken

```
\psset{xunit=1.0cm,yunit=1.0cm,algebraic=true,dimen=middle,dotstyle=o,dotsize=5pt
      0,linewidth=1.6pt,arrowsize=3pt 2,arrowinset=0.25}
\begin{pspicture*}(-3.8,-2.5)(3.8,4.8)
\multips(0,-2)(0,1.0){8}{\psline[linestyle=dashed,linecap=1,dash=1.5pt 1.5pt,
     linewidth=0.4pt,linecolor=gray]{c-c}(-3.8,0)(3.8,0)}
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\psplot[linewidth=0.8pt,plotpoints=200]{-3.5}{3.5}{x^(2.0)-2.0}
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\begin{scriptsize}
\rput[bl](-2.38,4.36){$f$}
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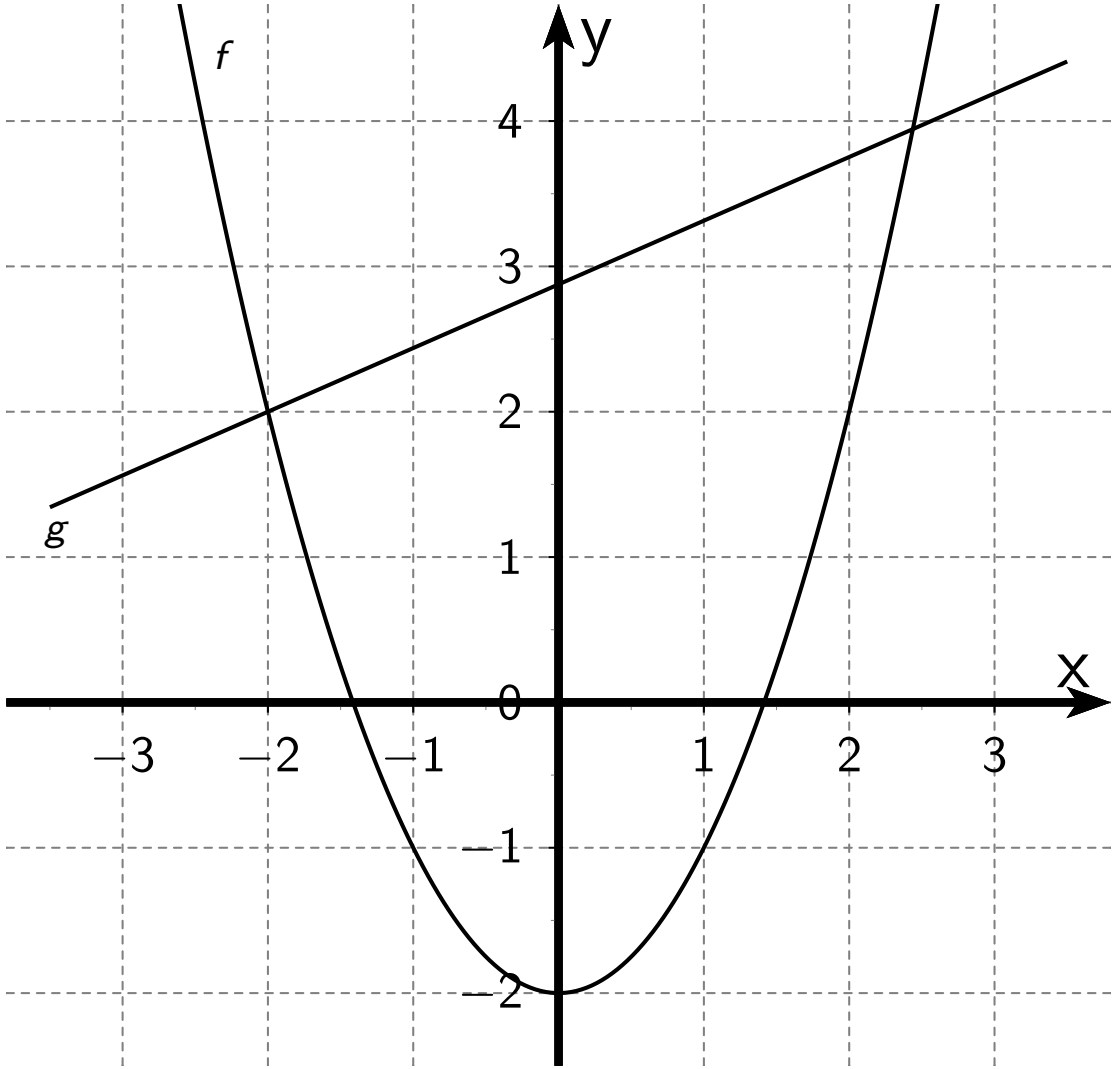

Der Code

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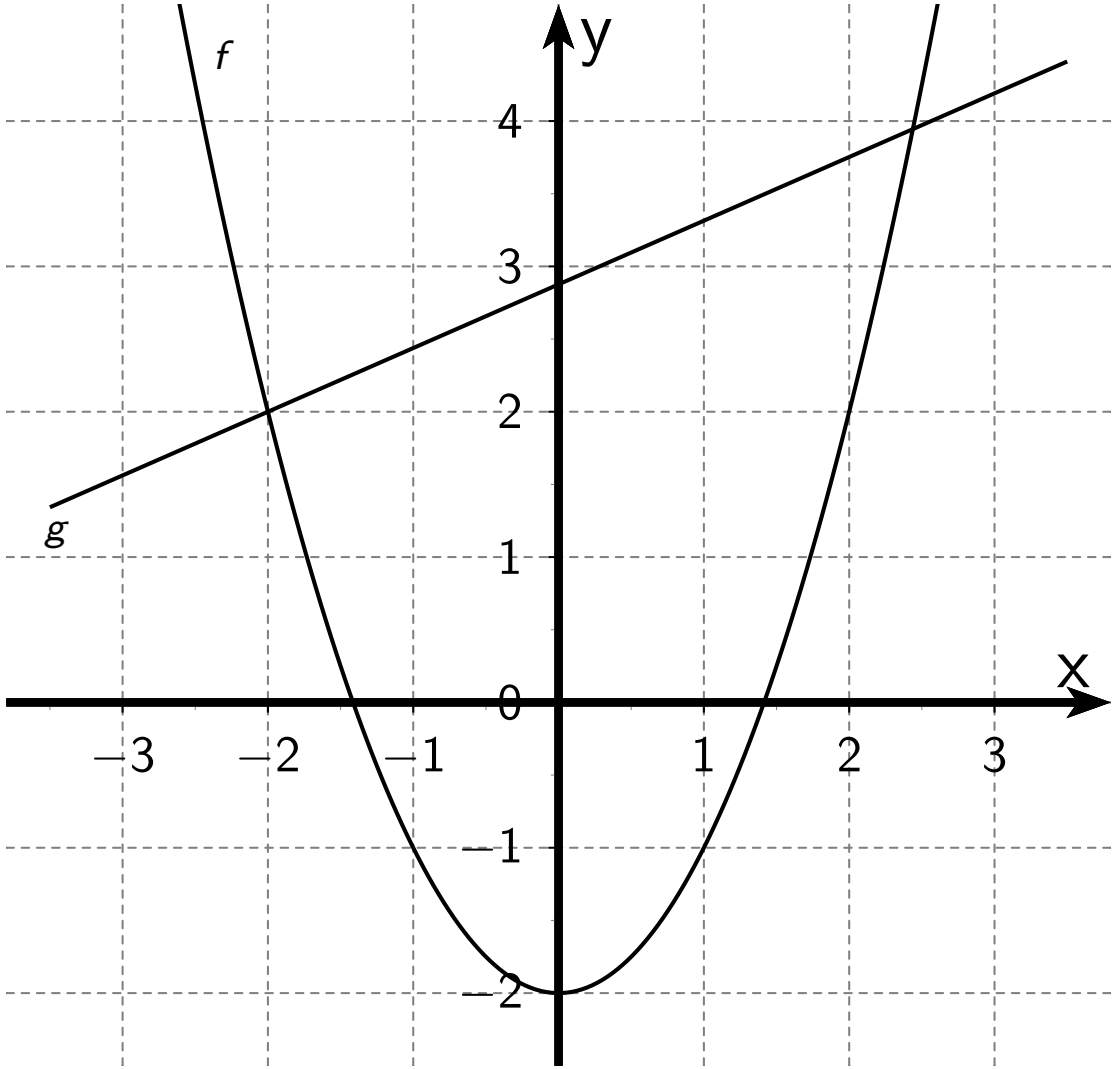

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\psplot[linewidth=0.8pt,plotpoints=200]{-3.5}{3.5}{x^(2.0)+1.0}
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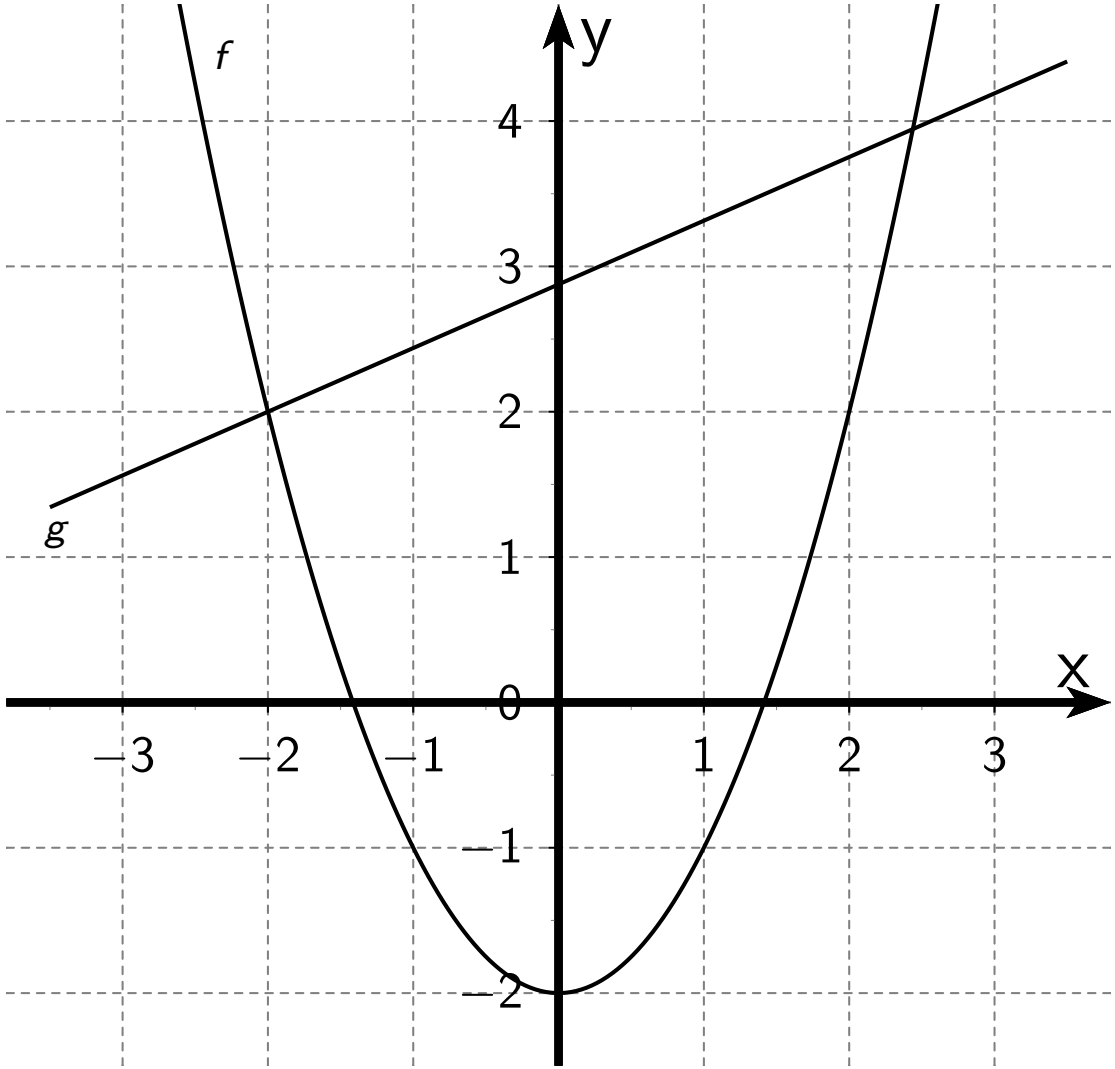
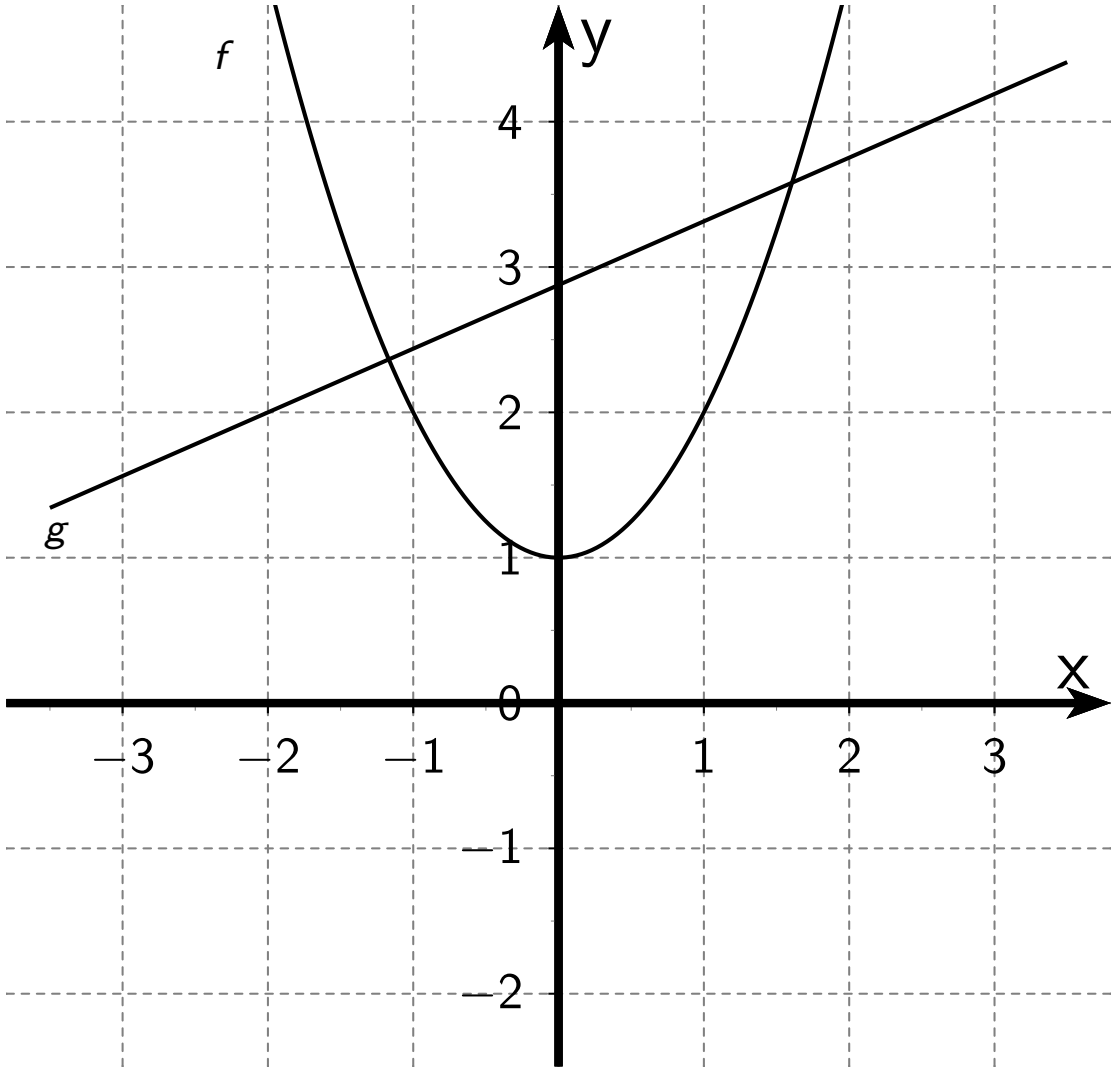
Verschieben von Funktionen




f
g
y
x
4
3
2
1
0
−1
−2
−3
−2
−1
1
2
3

GeoGebra Grafiken – Größe verändern

```
\psset{xunit=1.0cm,yunit=1.0cm,algebraic=true,dimen=middle,dotstyle=o,dotsize=5pt
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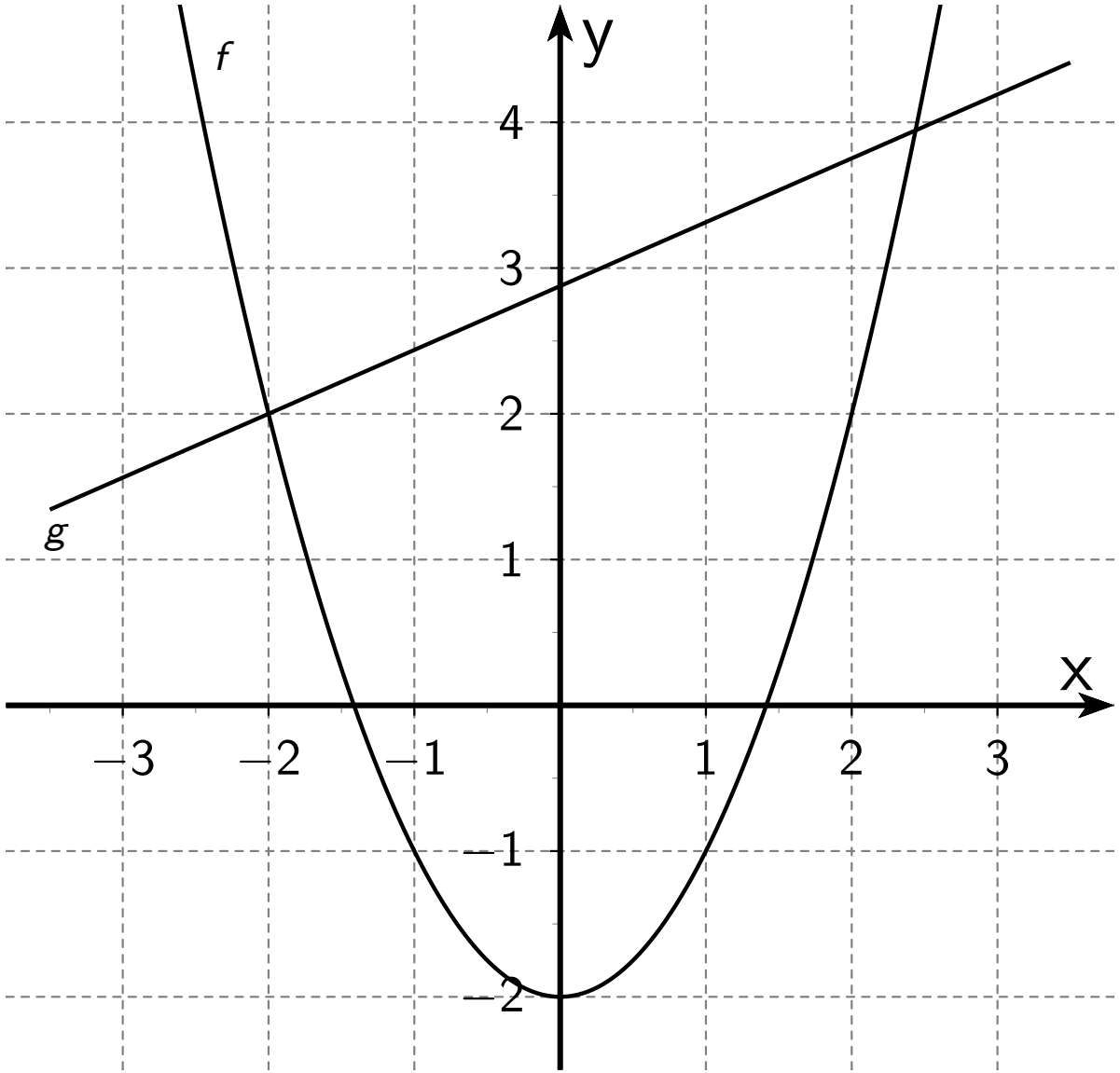

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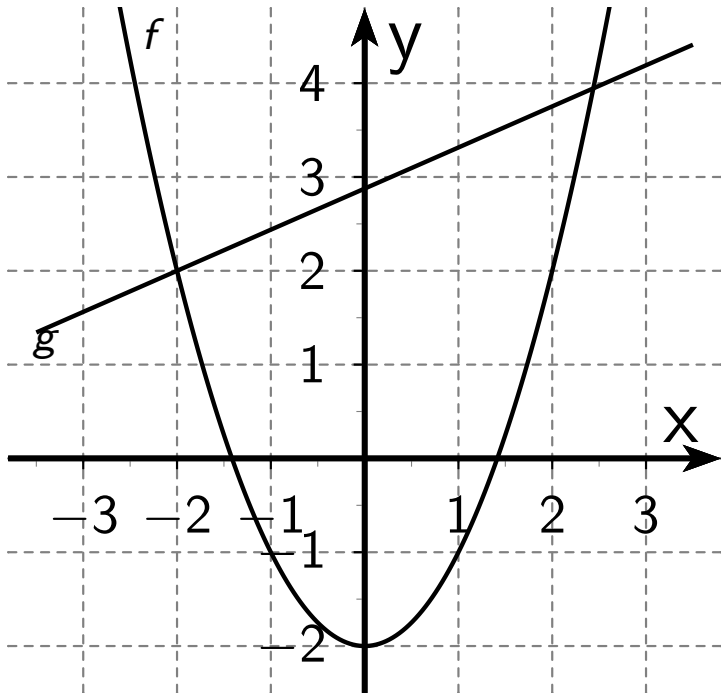


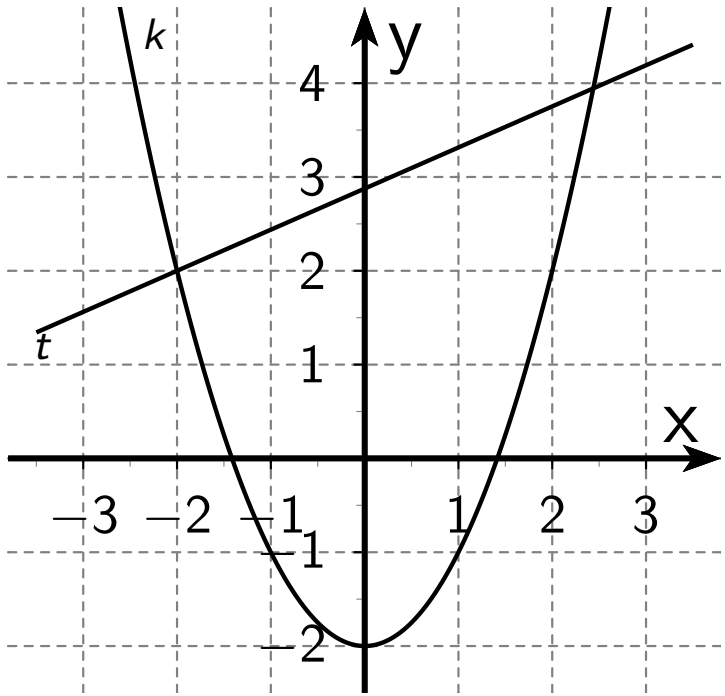
GeoGebra Grafiken – Beschriftung ändern

```
\psset{xunit=0.5cm,yunit=0.5cm,algebraic=true,dimen=middle,dotstyle=o,dotsize=5pt
      0,linewidth=1.6pt,arrowsize=3pt 2,arrowinset=0.25}
\begin{pspicture*}(-3.8,-2.5)(3.8,4.8)
\multips(0,-2)(0,1.0){8}{\psline[linestyle=dashed,linecap=1,dash=1.5pt 1.5pt,
     linewidth=0.4pt,linecolor=gray]{c-c}(-3.8,0)(3.8,0)}
\multips(-3,0)(1.0,0){8}{\psline[linestyle=dashed,linecap=1,dash=1.5pt 1.5pt,
     linewidth=0.4pt,linecolor=gray]{c-c}(0,-2.5)(0,4.8)}
\psaxes[labelFontSize=\scriptstyle,xAxis=true,yAxis=true,showorigin=false,Dx=1.,
     Dy=1.,ticksize=-2pt 0,subticks=2]{->}(0,0)(-3.8,-2.5)(3.8,4.8)[x,140] [y
     ,-40]
\psplot[linewidth=0.8pt,plotpoints=200]{-3.5}{3.5}{x^(2.0)+1.0}
\psplot[linewidth=0.8pt]{-3.5}{3.5}{(--12.77--1.94*x)/4.44}
\begin{scriptsize}
\rput[bl](-2.38,4.36){$f$}
\rput[bl](-3.54,1.06){$g$}
\end{scriptsize}
\end{pspicture*}
```

GeoGebra Grafiken – Beschriftung ändern

```
1  \psset{xunit=0.5cm,yunit=0.5cm,algebraic=true,dimen=middle,dotstyle=o,dotsize=5pt
       0,linewidth=1.6pt,arrowsize=3pt 2,arrowinset=0.25}
2  \begin{pspicture*}(-3.8,-2.5)(3.8,4.8)
3  \multips(0,-2)(0,1.0){8}{\psline[linestyle=dashed,linecap=1,dash=1.5pt 1.5pt,
       linewidth=0.4pt,linecolor=gray]{c-c}(-3.8,0)(3.8,0)}
4  \multips(-3,0)(1.0,0){8}{\psline[linestyle=dashed,linecap=1,dash=1.5pt 1.5pt,
       linewidth=0.4pt,linecolor=gray]{c-c}(0,-2.5)(0,4.8)}
5  \psaxes[labelFontSize=\scriptstyle,xAxis=true,yAxis=true,showorigin=false,Dx=1.,
       Dy=1.,ticksize=-2pt 0,subticks=2]{->}(0,0)(-3.8,-2.5)(3.8,4.8)[x,140] [y
       ,-40]
6  \psplot[linewidth=0.8pt,plotpoints=200]{-3.5}{3.5}{x^(2.0)+1.0}
7  \psplot[linewidth=0.8pt]{-3.5}{3.5}{(--12.77--1.94*x)/4.44}
8  \begin{scriptsize}
9  \rput[bl](-2.38,4.36){$k$}
10 \rput[bl](-3.54,1.06){$t$}
11 \end{scriptsize}
12 \end{pspicture*}
```

Beschriftung ändern



GeoGebra Grafiken – Beschriftung verschieben

```
1  \psset{xunit=0.5cm,yunit=0.5cm,algebraic=true,dimen=middle,dotstyle=o,dotsize=5pt
       0,linewidth=1.6pt,arrowsize=3pt 2,arrowinset=0.25}
2  \begin{pspicture*}(-3.8,-2.5)(3.8,4.8)
3  \multips(0,-2)(0,1.0){8}{\psline[linestyle=dashed,linecap=1,dash=1.5pt 1.5pt,
       linewidth=0.4pt,linecolor=gray]{c-c}(-3.8,0)(3.8,0)}
4  \multips(-3,0)(1.0,0){8}{\psline[linestyle=dashed,linecap=1,dash=1.5pt 1.5pt,
       linewidth=0.4pt,linecolor=gray]{c-c}(0,-2.5)(0,4.8)}
5  \psaxes[labelFontSize=\scriptstyle,xAxis=true,yAxis=true,showorigin=false,Dx=1.,
       Dy=1.,ticksize=-2pt 0,subticks=2]{->}(0,0)(-3.8,-2.5)(3.8,4.8)[x,140] [y
       ,-40]
6  \psplot[linewidth=0.8pt,plotpoints=200]{-3.5}{3.5}{x^(2.0)+1.0}
7  \psplot[linewidth=0.8pt]{-3.5}{3.5}{(--12.77--1.94*x)/4.44}
8  \begin{scriptsize}
9  \rput[bl](-2.38,4.36){$k$}
10 \rput[bl](-3.54,1.06){$t$}
11 \end{scriptsize}
12 \end{pspicture*}
```

GeoGebra Grafiken – Beschriftung verschieben

```
1  \psset{xunit=0.5cm,yunit=0.5cm,algebraic=true,dimen=middle,dotstyle=o,dotsize=5pt
       0,linewidth=1.6pt,arrowsize=3pt 2,arrowinset=0.25}
2  \begin{pspicture*}(-3.8,-2.5)(3.8,4.8)
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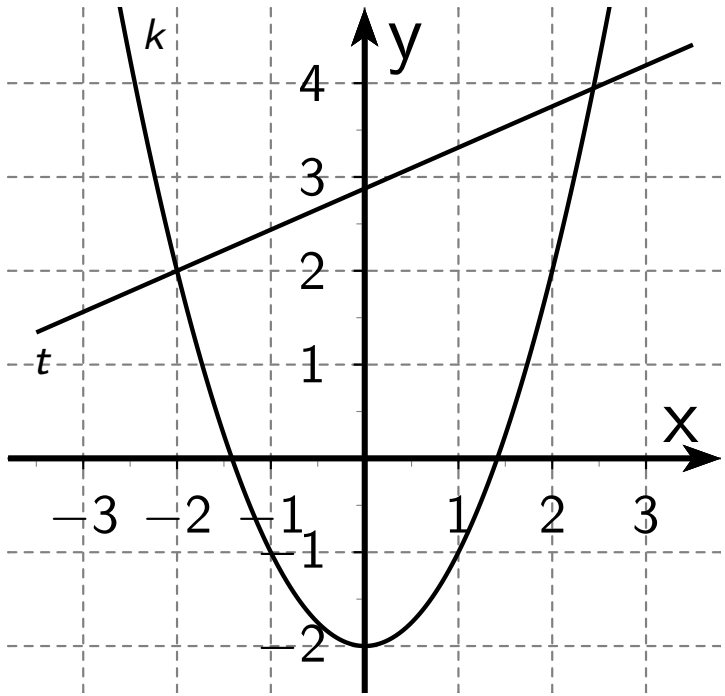
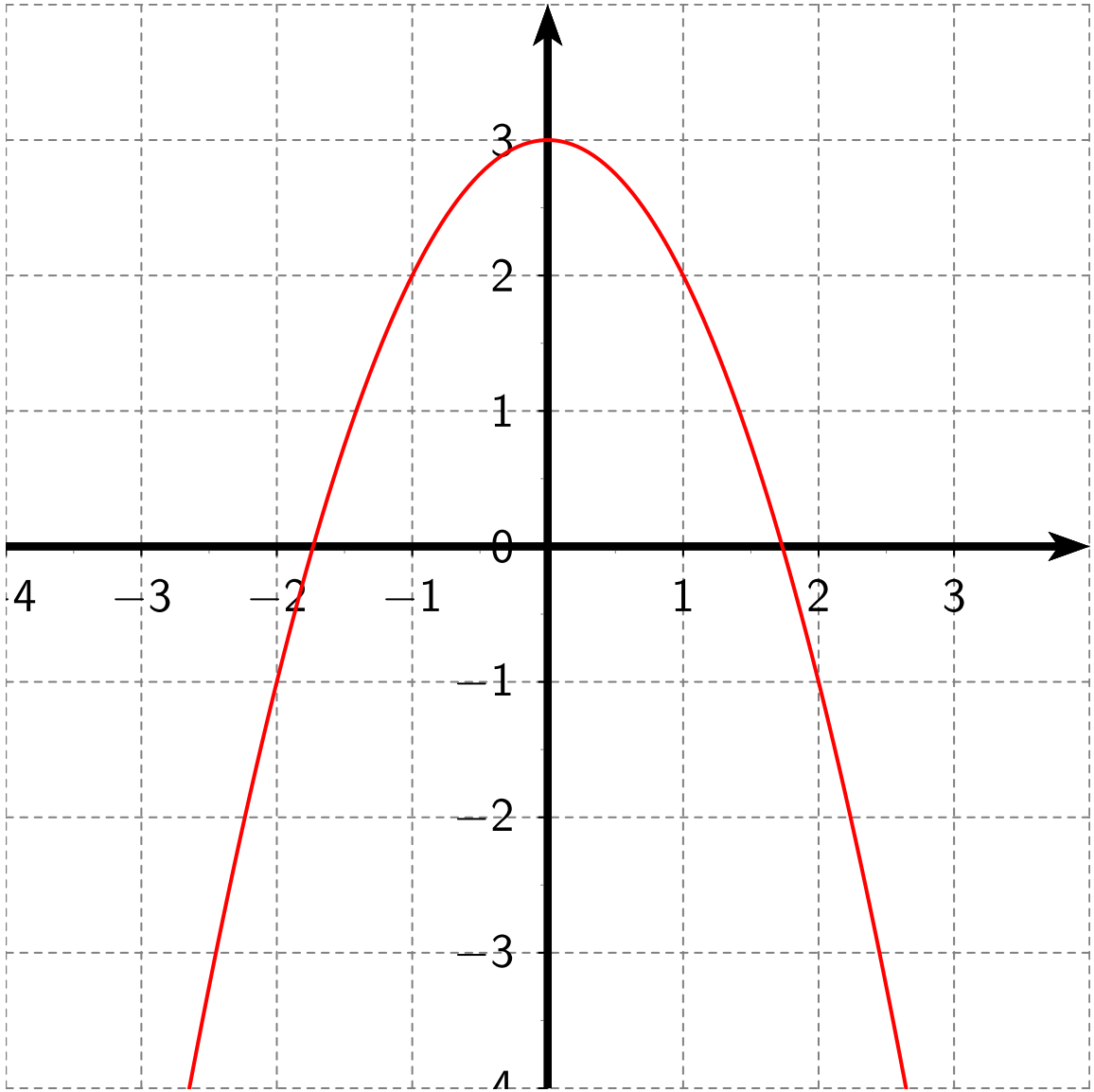
       linewidth=0.4pt,linecolor=gray]{c-c}(-3.8,0)(3.8,0)}
4  \multips(-3,0)(1.0,0){8}{\psline[linestyle=dashed,linecap=1,dash=1.5pt 1.5pt,
       linewidth=0.4pt,linecolor=gray]{c-c}(0,-2.5)(0,4.8)}
5  \psaxes[labelFontSize=\scriptstyle,xAxis=true,yAxis=true,showorigin=false,Dx=1.,
       Dy=1.,ticksize=-2pt 0,subticks=2]{->}(0,0)(-3.8,-2.5)(3.8,4.8)[x,140] [y
       ,-40]
6  \psplot[linewidth=0.8pt,plotpoints=200]{-3.5}{3.5}{x^(2.0)+1.0}
7  \psplot[linewidth=0.8pt]{-3.5}{3.5}{(--12.77--1.94*x)/4.44}
8  \begin{scriptsize}
9  \rput[bl](-2.38,4.36){$k$}
10 \rput[bl](-3.54,0.9){$t$}
11 \end{scriptsize}
12 \end{pspicture*}
```

Beschriftung verschieben



antwort-Befehl in Geogebra Grafiken



antwort-Befehl in Geogebra Grafiken

```
\psset{xunit=1.0cm,yunit=1.0cm,algebraic=true,dimen=middle,
    dotstyle=o,dotsize=5pt 0,linewidth=1.6pt,arrowsize=3pt 2,
    arrowinset=0.25}
\begin{pspicture*}(-4.,-4.)(4.,4.)
\multips(0,-4)(0,1.0){9}{\psline[linestyle=dashed,linecap=1,
    dash=1.5pt 1.5pt,linewidth=0.4pt,linecolor=gray]{c-c
    }(-4.,0)(4.,0)}
\multips(-4,0)(1.0,0){9}{\psline[linestyle=dashed,linecap=1,
    dash=1.5pt 1.5pt,linewidth=0.4pt,linecolor=gray]{c-c
    }(0,-4.)(0,4.)}
\psaxes[labelFontSize=\scriptstyle,xAxis=true,yAxis=true,Dx
    =1.,Dy=1.,ticksize=-2pt 0,subticks=2]{->}(0,0)(-4.,-4.)
    (4.,4.)
\psplot[linewidth=0.8pt,linecolor=red,plotpoints
    =200]{-4.0}{4.0}{-x^(2.0)+3.0}
\end{pspicture*}
```

antwort-Befehl in Geogebra Grafiken

```
\psset{xunit=1.0cm,yunit=1.0cm,algebraic=true,dimen=middle,
    dotstyle=o,dotsize=5pt 0,linewidth=1.6pt,arrowsize=3pt 2,
    arrowinset=0.25}
\begin{pspicture*}(-4.,-4.)(4.,4.)
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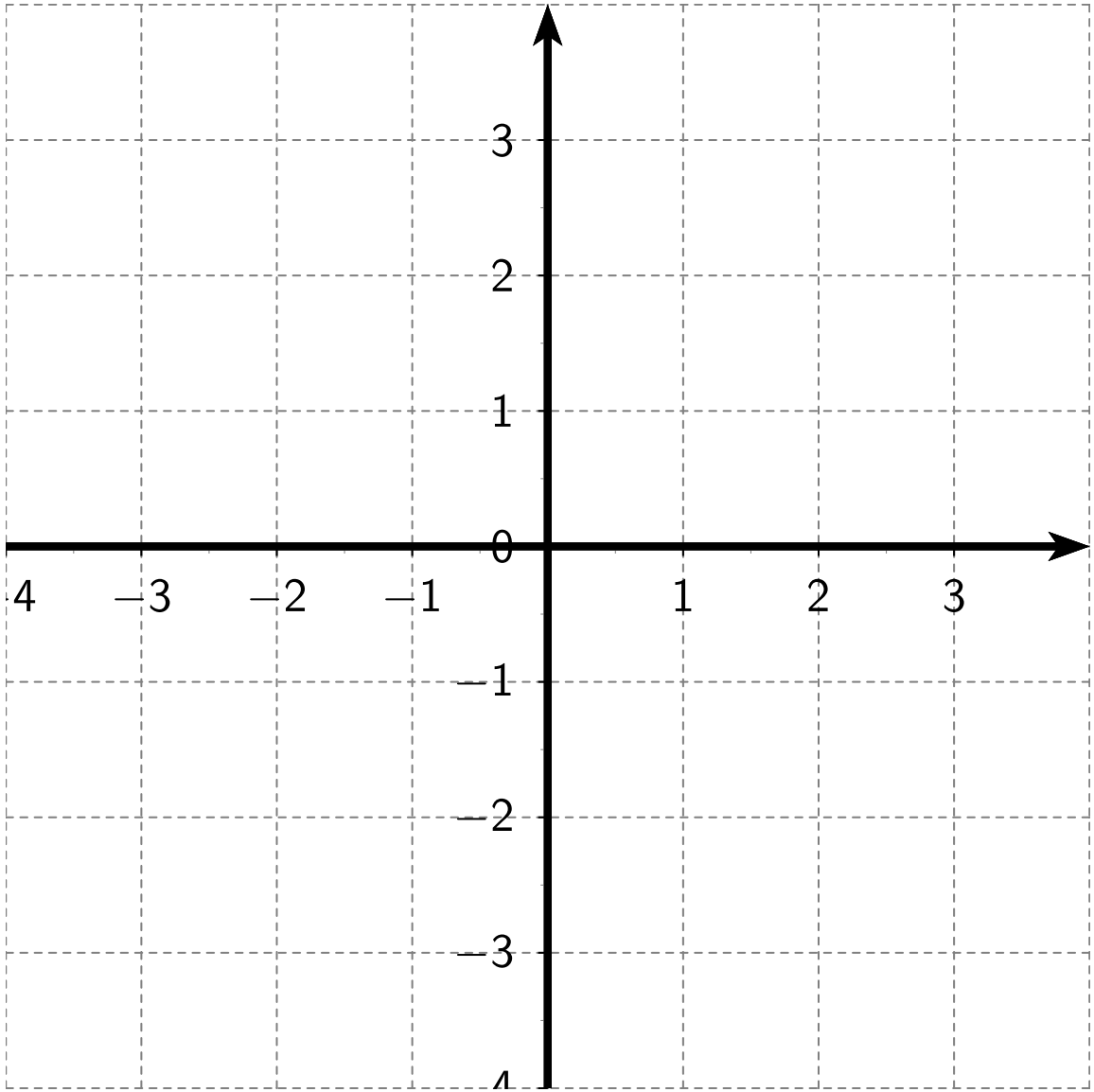
    dash=1.5pt 1.5pt,linewidth=0.4pt,linecolor=gray]{c-c
    }(-4.,0)(4.,0)}
\multips(-4,0)(1.0,0){9}{\psline[linestyle=dashed,linecap=1,
    dash=1.5pt 1.5pt,linewidth=0.4pt,linecolor=gray]{c-c
    }(0,-4.)(0,4.)}
\psaxes[labelFontSize=\scriptstyle,xAxis=true,yAxis=true,Dx
    =1.,Dy=1.,ticksize=-2pt 0,subticks=2]{->}(0,0)(-4.,-4.)
    (4.,4.)
\psplot[linewidth=0.8pt,linecolor=red,plotpoints
    =200]{-4.0}{4.0}{-x^(2.0)+3.0}
\end{pspicture*}
```

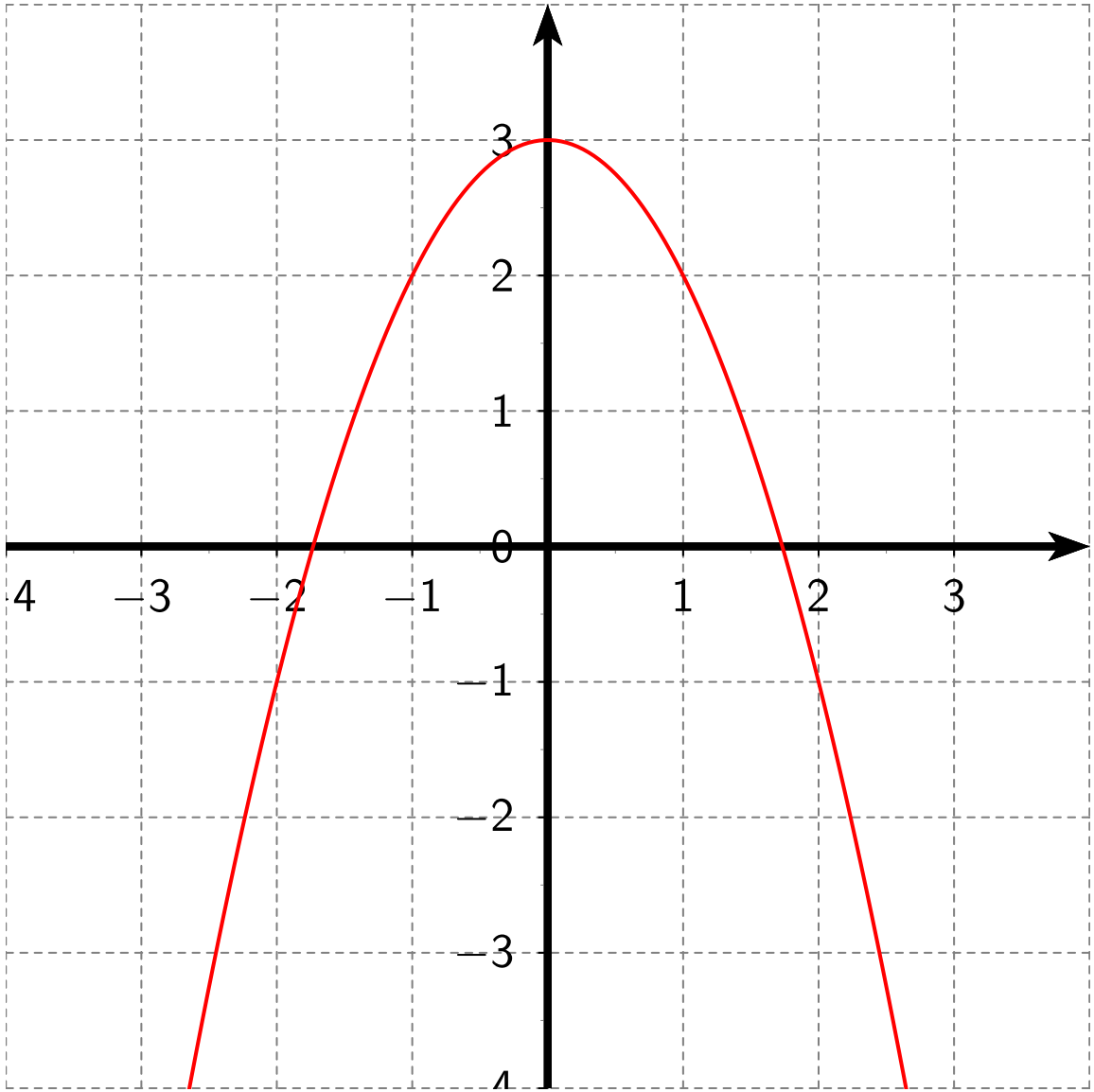
antwort-Befehl in Geogebra Grafiken

```
\psset{xunit=1.0cm,yunit=1.0cm,algebraic=true,dimen=middle,
    dotstyle=o,dotsize=5pt 0,linewidth=1.6pt,arrowsize=3pt 2,
    arrowinset=0.25}
\begin{pspicture*}(-4.,-4.)(4.,4.)
\multips(0,-4)(0,1.0){9}{\psline[linestyle=dashed,linecap=1,
    dash=1.5pt 1.5pt,linewidth=0.4pt,linecolor=gray]{c-c
    }(-4.,0)(4.,0)}
\multips(-4,0)(1.0,0){9}{\psline[linestyle=dashed,linecap=1,
    dash=1.5pt 1.5pt,linewidth=0.4pt,linecolor=gray]{c-c
    }(0,-4.)(0,4.)}
\psaxes[labelFontSize=\scriptstyle,xAxis=true,yAxis=true,Dx
    =1.,Dy=1.,ticksize=-2pt 0,subticks=2]{->}(0,0)(-4.,-4.)
    (4.,4.)
\antwort{\psplot[linewidth=0.8pt,linecolor=red,plotpoints
    =200]{-4.0}{4.0}{-x^(2.0)+3.0}}
\end{pspicture*}
```

solution_off



solution_on



Hilfe zur Erstellung unbekannter Funktionen – Geogebra

- TrendPoly(Liste von Punkten, Grad des Polynoms)

  Bsp: TrendPoly({A,B,C,D},3)

Hilfe zur Erstellung unbekannter Funktionen – Geogebra

- TrendPoly(Liste von Punkten, Grad des Polynoms)

  Bsp: TrendPoly({A,B,C,D},3)

- TrendPoly(Freihand Funktion, Grad des Polynoms)

  Bsp: TrendPoly(f, 4)