

Skizzieren die folgenden Funktionen in die vorbereiteten Koordinatensysteme!

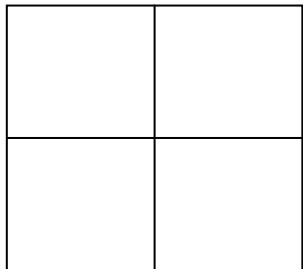
Prüfe mit [www.desmos.com](http://www.desmos.com)

**Lineare Funktionen**  $y = mx + n$

, besitzen den Anstieg m (Steilheit) und die Verschiebung n (y-Achse)

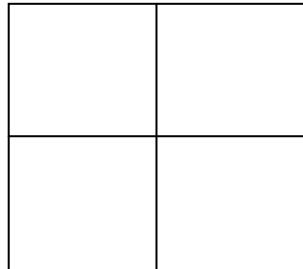
a)

$$\begin{aligned} y_1 &= 3x \\ y_2 &= 2x \\ y_3 &= 0,5x \end{aligned}$$



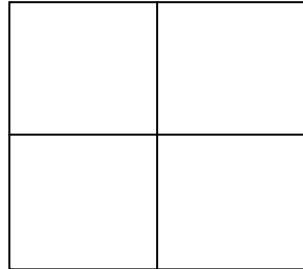
b)

$$\begin{aligned} y_1 &= 2x - 2 \\ y_2 &= 2x + 3 \\ y_3 &= 2x - 1 \end{aligned}$$



c)

$$\begin{aligned} y_1 &= -2x + 3 \\ y_2 &= 4x - 1 \\ y_3 &= 0,2x - 4 \end{aligned}$$

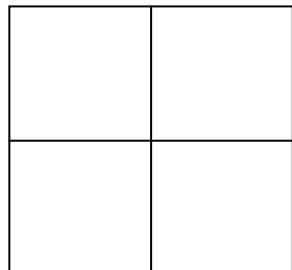


**Quadratische Funktionen**

$y = x^2$  (Standartparabel) oder  $y = (x+d)^2 + e$  (Scheitelpunktsform) oder  $y = x^2 + px + q$  (Normalform, ohne Formeln nix zu machen)

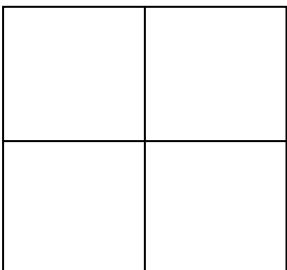
d)

$$\begin{aligned} y_1 &= x^2 \text{ Standartparabel} \\ y_2 &= x^2 + 4 \quad \text{verschoben nach } \underline{\hspace{2cm}} \\ y_3 &= -x^2 - 1 \quad \text{verschoben und } \underline{\hspace{2cm}} \end{aligned}$$



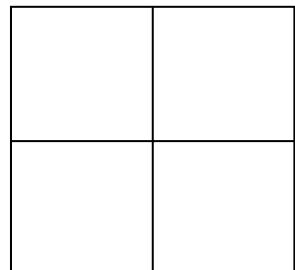
e)

$$\begin{aligned} &\text{Scheitelpunkt ablesbar!} \\ y_1 &= (x+3)^2 - 2 \\ y_2 &= (x-2)^2 - 5 \\ y_3 &= (x-3)^2 \end{aligned}$$



f)

$$\begin{aligned} y_1 &= -x^1 \\ y_2 &= -x^2 + 2 \\ y_3 &= -1 + x^2 \end{aligned}$$

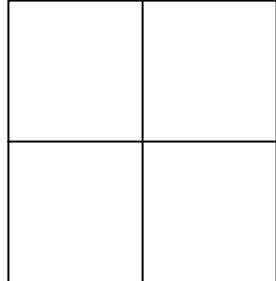


**Potenzfunktionen**  $y = ax^n + c$

n... Aussehen des Graphen, a... Steckung Stauchung und Spiegelung an der x-Achse, c ... Verschiebung auf der y-Achse

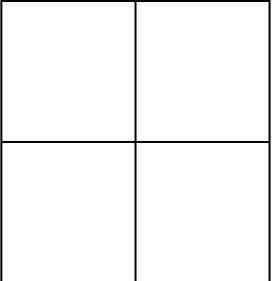
g)

$$\begin{aligned} y_1 &= x^2 \\ y_2 &= 3x^2 \\ y_3 &= 0,2x^2 \end{aligned}$$



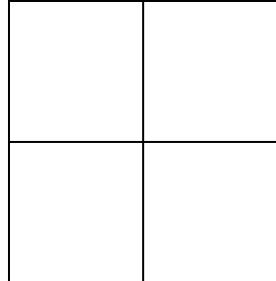
h)

$$\begin{aligned} y_1 &= x^5 \\ y_2 &= x^5 - 3 \\ y_3 &= 2x^5 \end{aligned}$$



i)

$$\begin{aligned} y_1 &= -x^{-1} \\ y_2 &= -x^3 \\ y_3 &= -x^{-2} \end{aligned}$$

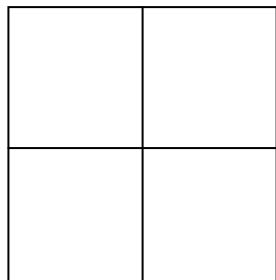


**Exponentialfunktionen**  $y = c \cdot a^x$

a... Fixpunkt (0,c) und (1, ac), c... Steckung Stauchung und Spiegelung an der x-Achse

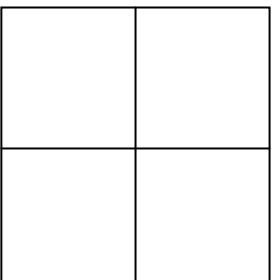
g)

$$\begin{aligned} y_1 &= 2^x \\ y_2 &= 3^x \\ y_3 &= 0,5^x \end{aligned}$$



h)

$$\begin{aligned} y_1 &= -10^x \\ y_2 &= (-10)^x \\ y_3 &= (\frac{1}{10})^x \end{aligned}$$



$a^x$  und  $(\frac{1}{a})^x$  stehen in Beziehung

i)

$$\begin{aligned} y_1 &= -x^{-1} \\ y_2 &= -x^3 \\ y_3 &= -x^{-2} \end{aligned}$$

