

Aufgaben Eigenschaften von Funktionen 1

- a.) punktsymm. $x_N = 0$ $y_S = 0$
b.) punktsymm. $x_{N_1} = 0$ $y_S = 0$
c.) achsensymm. $x_{N_1} = -\frac{\sqrt{2}}{2}$ $x_{N_2} = 0$ $x_{N_3} = \frac{\sqrt{2}}{2}$ $y_S = 0$
d.) punktsymm. $x_{N_1} = -2$ $x_{N_2} = 0$ $x_{N_3} = 2$ $y_S = 0$

2.) a.) $f(x)$: DB: $x \in \mathbb{R}$ $x_N = 0$

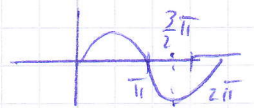
$g'(x)$: DB: $x \in \mathbb{R}$, $x_N = 0$

b.) $f(x)$: $f(x) = p(-x)$ $f(-x) = -\frac{4x}{x^2+1}$
 $f(x) \neq f(-x) \Rightarrow$ keine Achsensymmetrie
 $-f(x) = -\frac{4x}{x^2+1} \Rightarrow f(-x) = -f(x)$
 \Rightarrow punktsymm.

3.) DB: $x \in \mathbb{R}$, $S_T(0/2)$

$$0 = 2 + 2 \sin(0,5 \cdot 3\pi) = 2 + 2 \sin\left(\frac{3}{2}\pi\right)$$

$$0 = 2 - 2 \cdot 1 = 0$$



4.) DB: $x \in \mathbb{R}$ $x_N = 0$

$$f(-x) = -\frac{20x}{(x^2+3)^2} \quad -f(x) = \frac{-20x}{(x^2+3)^2} \Rightarrow \underline{\underline{\text{punktsymm.}}}$$

$$\lim_{x \rightarrow \pm\infty} f(x) = 0 \Rightarrow \underline{\underline{y=0}}$$

5.) DB: $x \in \mathbb{R}$, $x \neq \pm \frac{3}{2}$

$$\underline{\underline{x_{P_1} = \frac{3}{2}}} \quad \underline{\underline{x_{P_2} = -\frac{3}{2}}}$$

$$\underline{\underline{x_{N_1} = 3}}$$

$$\underline{\underline{x_{N_2} = -3}}$$

$$f(-x) = \frac{(-x)^2 - 9}{(-x)^2 - \frac{9}{4}} \quad f(x) = \frac{x^2 - 9}{x^2 - \frac{9}{4}}$$

$$f(-x) = f(x) \Rightarrow \text{achsensymmetrisch}$$

6.) DB: $x \in \mathbb{R}, x \neq 1$

Nst.: $0 = x^2 + 3x - x$

$$\underline{\underline{x_1 = -2}} \quad \therefore \quad \underline{\underline{x_2 = 0}}$$

keine waagerechte Asymptote

senkrechte Asymptote: $x = 1$

schräge Asymptote:

$$\underline{\underline{- \left(\begin{array}{r} x^2 + 3x - x \\ x^2 \quad - x \end{array} \right) : (x-1) = x+3 + \frac{3}{x-1}}}$$

$$\underline{\underline{- \left(\begin{array}{r} 3x \\ 3x - 3 \end{array} \right) \\ 3}}$$

$$\underline{\underline{y = x+3}}$$