

S. 77 / 6. g,

$$f(x) = \frac{1}{20}x^5 - \frac{1}{6}x^3$$

1) $\mathbb{D} = \mathbb{R}$

2) A: $f(-x) = -\frac{1}{20}x^5 + \frac{1}{6}x^3 \neq f(x)$

P: $-f(x) = -\left(\frac{1}{20}x^5 - \frac{1}{6}x^3\right) = -\frac{1}{20}x^5 + \frac{1}{6}x^3 = f(-x)$

→ punktsymmetrisch

3) NS: $f(x) = 0 \iff \frac{1}{20}x^5 - \frac{1}{6}x^3$

$$x^3 \left(\frac{1}{20}x^2 - \frac{1}{6} \right)$$

$$x_1 = 0; \quad x_2 = \sqrt{\frac{10}{3}}; \quad x_3 = -\sqrt{\frac{10}{3}}$$

4) Verhalten im Unendlichen:

$$\lim_{x \rightarrow \infty} \left(\frac{1}{20}x^5 - \frac{1}{6}x^3 \right) = +\infty$$

$$\lim_{x \rightarrow -\infty} \left(\frac{1}{20}x^5 - \frac{1}{6}x^3 \right) = -\infty$$

5) $f'(x) = 0,25x^4 - 0,5x^2$

$$f'(x) = 0 \iff x^2(0,25x^2 - 0,5)$$

$$x_4 = 0; \quad x_5 = \sqrt{2}; \quad x_6 = -\sqrt{2}$$

Exakte Werte angeben!

Vorzeichen-tabelle:

x	$x < -\sqrt{2}$	$x = -\sqrt{2}$	$-\sqrt{2} < x < 0$	$0 = x$	$0 < x < \sqrt{2}$	$x = \sqrt{2}$	$x > \sqrt{2}$
$f'(x)$	+	0	-	0	-	0	+
$f(x)$	SMS	Max $(-\sqrt{2} -\frac{1}{6})$ -0,19	smf	(0 0) ↓ Terrassenpunkt	smf	Min $(\sqrt{2} \frac{1}{6})$ 0,19	SMS

