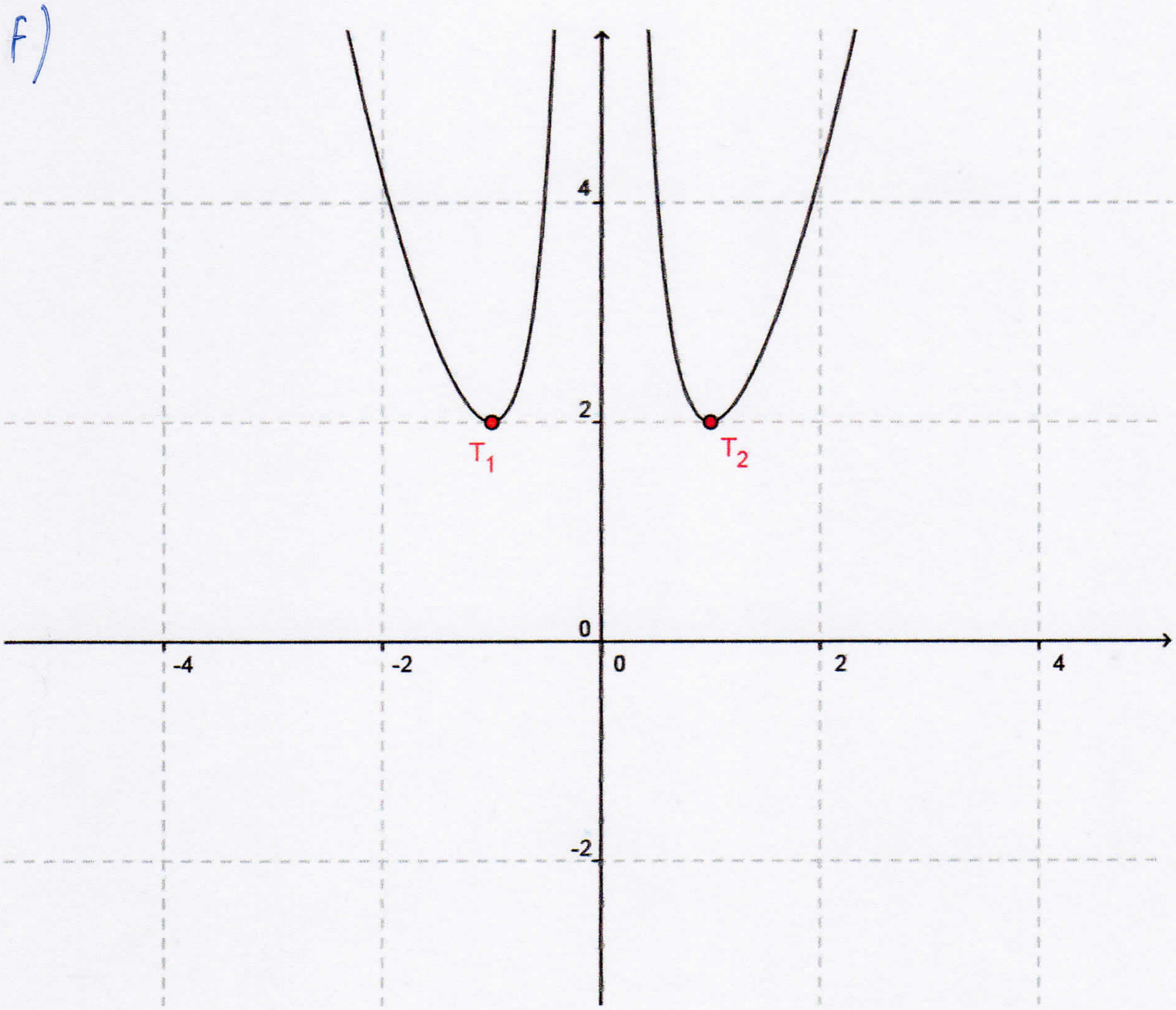
S 55 Nr 4

f)



$f(x) = \frac{1}{x^2} + x^2$, $D_f = \mathbb{R} \setminus \{0\}$, $f'(x) = -\frac{2}{x^3} + 2x$

Extrema notw. Bed $f'(x) = 0$

$$-\frac{2}{x^3} + 2x = 0 \Rightarrow \frac{2}{x^3} = 2x \;|\cdot x^3 \Rightarrow 2 = 2x^4 \;|:2$$

$$\Rightarrow x^4 = 1 \Rightarrow \underline{\underline{x_{1,2} = \pm\sqrt[4]{1} = \pm 1}}$$

hinreichende Bed

$f'(-2) = \frac{-2}{(-2)^3} + 2\cdot(-2) = \frac{1}{4} - 4 < 0 \Rightarrow f'(x) < 0$ fur $x < -1$

$f'(-\frac{1}{2}) = \frac{-2}{(-\frac{1}{2})^3} + 2\cdot(-\frac{1}{2}) = 16 - 1 > 0 \Rightarrow f'(x) > 0$ fur $-1 < x < 0$

$f'(\frac{1}{2}) = \frac{-2}{(\frac{1}{2})^3} + 2\cdot(\frac{1}{2}) = -16 + 1 < 0 \Rightarrow f'(x) < 0$ fur $0 < x < 1$

$f'(2) = \frac{-2}{2^3} + 2\;2 = -\frac{1}{4} + 4 > 0 \Rightarrow f'(x) > 0$ fur $1 < x$

$\Rightarrow$ VZW $-$ nach $+$ an der Stelle $x_1 = -1 \Rightarrow \underline{\underline{T(-1|2)}}$

VZW $-$ nach $+$ an der Stelle $x_2 = +1 \Rightarrow \underline{\underline{T(1|2)}}$