

Muster Lösung H.A.

S. 102 | 1 a-c nur Extrema

a) $f(x) = \frac{1}{6}x^3 - x^2$ $f'(x) = \frac{1}{2}x^2 - 2x$ $f''(x) = x - 2$

$f'(x) = 0 \Leftrightarrow 0 = x^2 - 4x = x(x-4), x \in \{0, 4\}$

$f''(0) = -2 \Rightarrow \text{Max.}$

$f''(4) = 2 \Rightarrow \text{Min.}$

b) $f(x) = x^3 - 6x^2 + 9x$, $f'(x) = 3x^2 - 12x + 9$, $f''(x) = 6x - 12$

$f'(x) = 0 \Leftrightarrow 0 = x^2 - 4x + 3$

$x_{1,2} = 2 \pm \sqrt{1}, x \in \{1, 3\}$

$f''(1) = -6 \Rightarrow \text{Max.}$

$f''(3) = 6 \Rightarrow \text{Min.}$

c) $f(x) = \frac{1}{3}x^3 - 2x^2 + 4x - \frac{7}{3}$, $f'(x) = x^2 - 4x + 4$ $f''(x) = 2x - 4$
 $= (x-2)^2$

$f'(x) = 0 \Leftrightarrow x = 2$

$f''(2) = 0 \Leftrightarrow ?$

f' : Parabel mit Scheitel $(2; 0)$ 

\Rightarrow kein VZW bei 2

\Rightarrow kein Extremum