Abi Aufgabe A5 (Musteraufgabe)

a.

$f_t(x) = \frac{t+ln(x)}{x}$

$f_t'(x) = \frac{\frac{1}{x} \cdot x - (t + \ln(x) \cdot 1)}{x^2} = \frac{1 - \mathrm{t} + \ln(x)}{x^2}$

$f''_t(x) = \frac{-3 + 2t + 2\ln(x)}{x^3}$

$f_t'''(x) = \frac{11-6t-6\ln(x)}{x^4}$

Aufgabe a :

Nullstellen: $0 = t + \ln(x)$ x=(e^{-t}/0)

$-t = \ln(x)$

$\boldsymbol{x = e^{-t}}$

Extremstellen: $0 = 1 - t - \ln(x)$ $f_t(e^{1-t}) = e^{t-1}$

$\ln(x) = 1 - t$

$\boldsymbol{x = e^{1-t}}$

$f_t''(e^{1-t}) < 0$ HP :(e^{1-t}/e^{t-1})

Wendestellen: $0 = -3 + 2t + 2\ln(x)$ $\boldsymbol{x = e^{1,5-t}}$

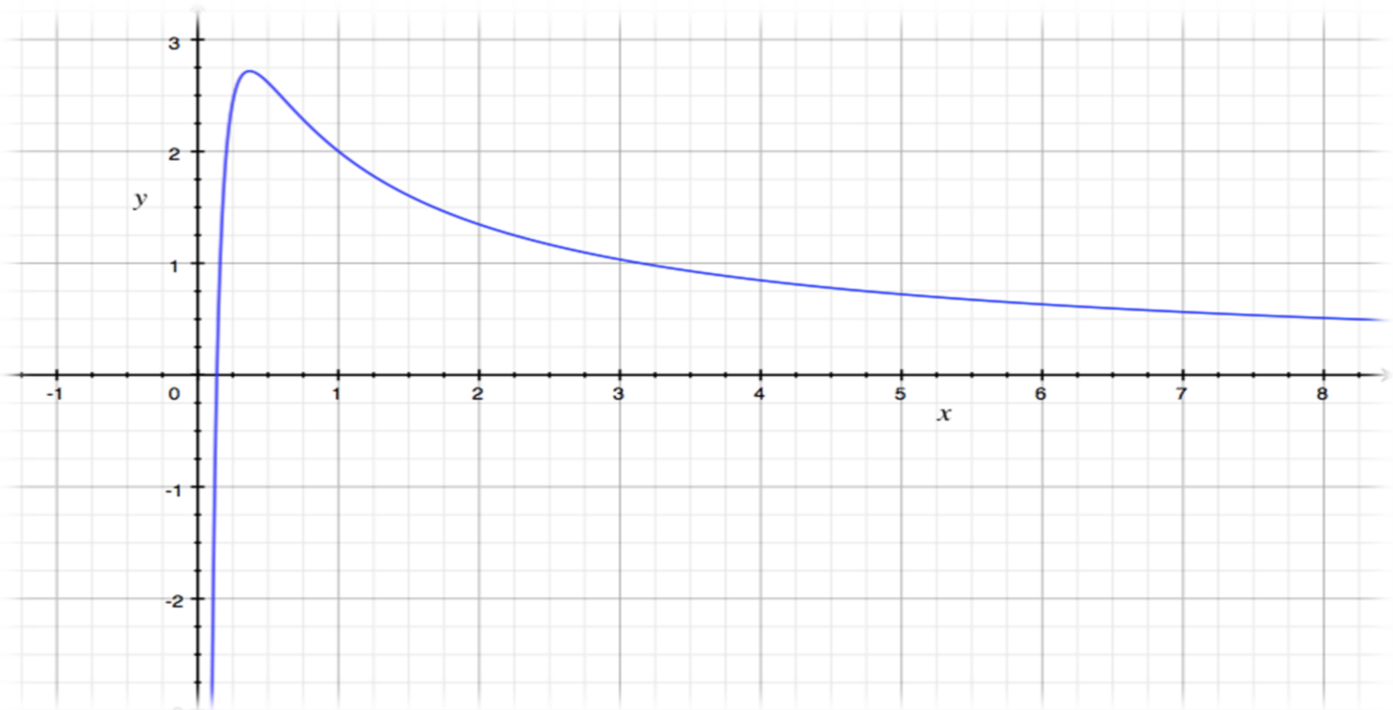
$$3 = 2t + 2\ln(x)$$

$$1{,}5 - t = \ln(x)$$

$f_t(e^{1,5-t}) = 1{,}5\ e^{t-1,5}$ WS: $(e^{1,5-t}/1{,}5\ e^{t-1,5})$

$f_t'''(e^{1,5-t}) > 0$ rechts-links Kurve

$\lim_{x \to o} \left(\frac{t+\ln(x)}{x}\right) \to -\infty$ $\lim_{x \to +\infty} \left(\frac{t+\ln(x)}{x}\right) \to 0$



$$f_2(x) = \frac{2 + \ln(x)}{x}$$