Lösung Langzeit

14

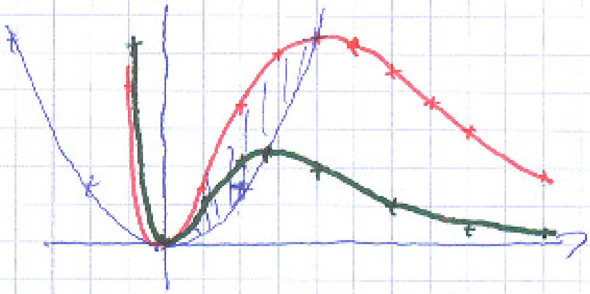
Analysis b)

6

K_1 $T(0|0)$ $H(2|2{,}707)$

$K_{1,5}$ $T(0|0)$ $H(\frac{4}{3}|1{,}203)$

2



$$f_t'(x) = 10x e^{-tx} - 5t x^2 e^{-tx} = e^{-tx}(10x - 5tx^2)$$

$$f_t''(x) = (10 - 10tx)e^{-tx} - (10xt - 5t^2x^2)e^{-tx}$$

$$= (10 - 10tx - 10tx + 5t^2x^2)e^{-tx}$$

$$= (10 - 20tx + 5t^2x^2)e^{-tx}$$

$f_t'(x) = 0 \Rightarrow x_1 = 0$ $f_t''(0) > 0$ $T(0|0)$

$x_2 = \frac{2}{t}$ $f_t''\left(\frac{2}{t}\right) = (10 - 40 + 20) \ldots < 0$

$$f\left(\frac{2}{t}\right) = 5 \cdot \frac{4}{t^2} \cdot e^{-2} = \frac{20}{t^2 e^2}$$

$$H\left(\frac{2}{t} \,\middle|\, \frac{20}{t^2 e^2}\right)$$

Nachweis mit 2. Abl.

1

$x = \frac{2}{t}$ $t = \frac{2}{x}$ in y

$$y = \frac{20}{\frac{4}{x^2} e^2} = \frac{5x^2}{e^2}$$

OL: $g(x) = y = \frac{5}{e^2} x^2$ 2

1   $T(0|0)$ liegt wegen $g(0) = 0$ darauf

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c) Intervallgrenzen GTR

5

$a = 0$ $b = 2$

3   $A = \int_0^2 (f_1(x) - g(x))\,dx = 1{,}429$ FE $\rightarrow \boxed{c}$

2   $0{,}714 = \int_0^x h(x)\,dx \rightarrow$ GTR $\rightarrow x = 1{,}116$