LS-Kursstufe Seite 100

Nr. 12)

$$\text{Kosten}_{ges} = \int_{0,5}^{400,5} \left(\frac{1}{15000}(x-600)^2+21\right)dx \quad ; \quad x<600$$

$$= \left[\frac{1}{15000}\cdot\frac{(x-600)^3}{3}+21x\right]_{0,5}^{400,5}$$

$$= \frac{1}{45000}(400,5-600)^3+21\cdot 400,5) - \left\{\frac{1}{45000}\cdot(0,5-600)^3+21\cdot 0,5\right\}$$

$\approx \underline{\underline{13011,56\text{ €}}}$ Gesamte Produktionskosten

Durchschnittliche Produktionskosten $= \dfrac{13011,56\text{ €}}{400} \approx \underline{\underline{32,53\text{ €}}}$

Nr. 15a) $f(x) = \frac{1}{2}x+4 \quad ; \quad a=0 \quad ; \quad \bar{m}=5$

$$5 = \frac{1}{b-0}\cdot\int_0^b \left(\frac{1}{2}x+4\right)dx = \frac{1}{b}\cdot\left[\frac{1}{2}\cdot\frac{x^2}{2}+4x\right]_0^b$$

$$5 = \frac{1}{b}\cdot\left(\frac{b^2}{4}+4b-\{0\}\right) = \frac{1}{4}b+4 \;\Big|\; -4 \Rightarrow 1 = \frac{1}{4}b \Rightarrow \underline{\underline{b=4}}$$

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b) $f(x) = 3x^2-1 \quad ; \quad a=0 \quad ; \quad \bar{m}=15$

$$15 = \frac{1}{b-0}\int_0^b (3x^2-1)\,dx = \frac{1}{b}\cdot\left[3\cdot\frac{x^3}{3}-1x\right]_0^b = \frac{1}{b}(b^3-b-\{0\})$$

$$15 = b^2-1 \;|\; +1 \Rightarrow 16 = b^2 \;|\; \sqrt{\ } \Rightarrow b_{1,2} = (\pm)\,4 \Rightarrow \underline{\underline{b=4}}\;;\; b>0$$

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c) $f(x) = 2x-3 \quad ; \quad a=-2 \quad ; \quad \bar{m}=1$

$$1 = \frac{1}{b-(-2)}\int_{-2}^b (2x-3)\,dx = \frac{1}{b+2}\left[\cancel{2}\cdot\frac{x^2}{\cancel{2}}-3x\right]_{-2}^b \quad ; \quad b \neq -2$$

$$1 = \frac{1}{b+2}\cdot(b^2-3b-\{4+6\}) = \frac{1}{b+2}(b^2-3b-10) \;|\; \cdot(b+2)$$

$$b+2 = b^2-3b-10 \;|\; -b-2 \Rightarrow b^2-4b-12=0$$

$$b_{1,2} = \frac{4\pm\sqrt{16-4\cdot 1\cdot(-12)}}{2\cdot 1} \Rightarrow b_1 = \frac{4+\sqrt{64}}{2} = \frac{4+8}{2} = \underline{\underline{6}}\;;\;(b_2 = -2 \notin D)$$

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