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HBFI 18a

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Mathe Arbeitsauftrag - Woche 2

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

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

$$\frac{6}{2} \pm \sqrt{9}$$

$$3 \pm 3$$

$$x_1 = 3 + 3 = 6$$

$$x_2 = 3 - 3 = 0$$

$$\int_0^6 \left(\frac{1}{2}x^2 - 3x \right) dx = \left[\frac{0,5}{3}x^3 - \frac{3}{2}x^2 + \overset{\text{bel. Zahl}}{0} \right]_0^6$$

$$A_0 = \left(\frac{0,5}{3} \cdot 6^3 - \frac{3}{2} \cdot 6^2 \right) - \left(\frac{0,5}{3} \cdot 0^3 - \frac{3}{2} \cdot 0^2 \right) = \underline{\underline{-18 \text{ FE}}}$$

$$b) f(x) = \frac{1}{2}x^4 + x^3$$

$$f(x) = \left(\frac{1}{2}x + 1 \right) \cdot x^3$$

$$\int_0^{-2} \left(\frac{1}{2}x^4 + x^3 \right)$$

$$\frac{1}{2}x + 1 = 0 \quad | -1$$

$$\frac{1}{2}x = -1 \quad | \cdot 2$$

$$x = -2$$

$$dx = \left[\frac{0,5}{5}x^5 + \frac{1}{4}x^4 \right]_0^{-2}$$

$$A_0 = \left(\frac{0,5}{5} \cdot (-2)^5 + \frac{1}{4} \cdot (-2)^4 \right) - \left(\frac{0,5}{5} \cdot 0^5 + \frac{1}{4} \cdot 0^4 \right)$$

$$= \underline{\underline{\frac{4}{5} \text{ FE}}}$$

$$x^3 = 0 \quad | \sqrt[3]{}$$

$$x = 0$$

$$x_1 = 0$$

$$x_2 = -2$$

$$c) f(x) = -x^4 + 6x^3 - 9x^2$$

$$f(x) = x^2 (-x^2 + 6x - 9) \quad | \cdot (-1)$$

$$= \underbrace{-x^2}_{\substack{\downarrow \\ \text{Doppelte NST}}} (x^2 \underbrace{-6x}_p \underbrace{+9}_q)$$

Doppelte NST

$$x_3 = 0 \quad x_4 = 0$$

$$\text{pq-Formel: } 3 \pm \sqrt{9-9}$$

$$x_1 = 3 \quad x_2 = 3$$

$$\int_3^0 \cancel{f(x)} (-x^4 + 6x^3 - 9x^2)$$

$$dx = \left[-\frac{1}{5} x^5 + \frac{6}{4} x^4 - \frac{9}{2} x^3 + \frac{27}{2} x^2 \right]$$

$$A_0 = \underline{\underline{-8,1 \text{ FE}}}$$

$$d) f(x) = \frac{1}{2} x^2 - \frac{1}{2} x - 3$$

$$f(x) = \frac{1}{2} (x^2 \underbrace{-1x}_p \underbrace{-6}_q)$$

$$0,5 \pm \sqrt{0,25 + 6}$$

$$0,5 \pm 2,5$$

$$x_1 = 0,5 + 2,5 = 3$$

$$x_2 = 0,5 - 2,5 = -2$$

Ab hier komm ich nicht weiter.

Zeichnungen

