

Mathe Arbeitsauftrag

Aufgabe 1

a)

$$\int_1^3 \frac{3}{4}x^2 + 1$$

$$\begin{aligned} dx &= \left[\frac{3}{12}x^3 + x \right]_1^3 \\ &= \left[\frac{1}{4}x^3 + x \right]_1^3 \end{aligned}$$

$$\begin{aligned} A_0 &= \left(\frac{1}{4} \cdot 3^3 + 3 \right) - \left(\frac{1}{4} \cdot 1^3 + 1 \right) \\ &= \underline{\underline{8,5}} \end{aligned}$$

$$b) \int_{-2}^1 -x^2 - 2x + 4$$

$$dx = \left[-\frac{1}{3}x^3 - x^2 + 4x \right]_{-2}^1$$

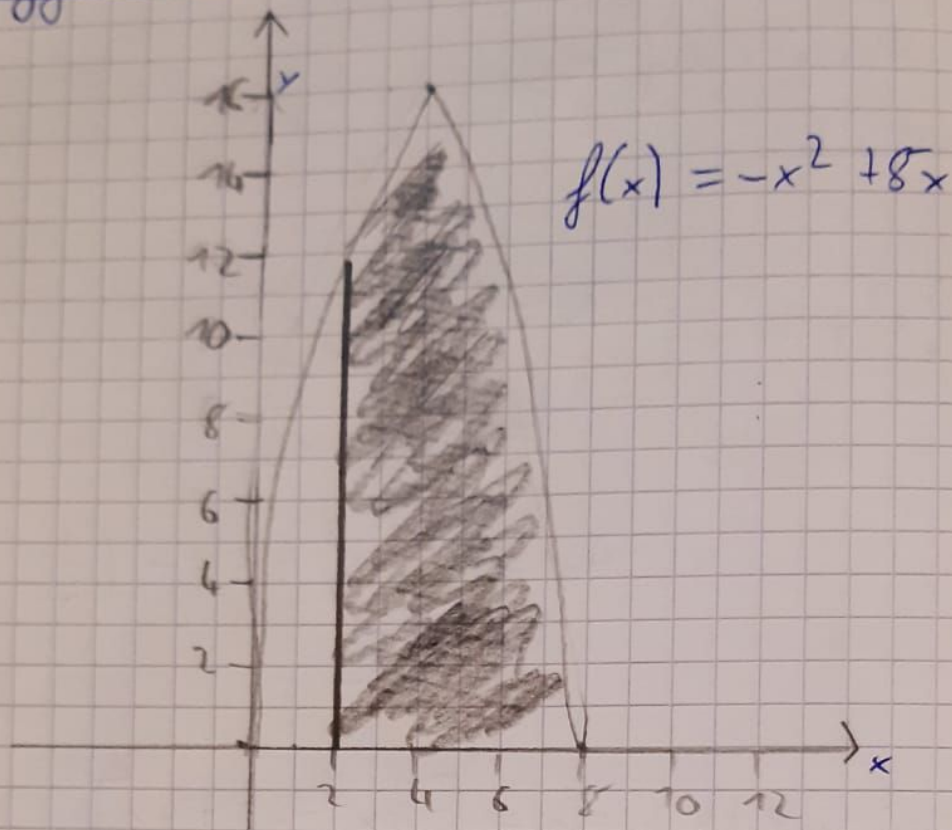
$$\begin{aligned} A_0 &= \left(-\frac{1}{3} \cdot 1^3 - 1^2 + 4 \cdot 1 \right) - \\ &\quad \left(-\frac{1}{3} \cdot (-2)^3 - (-2)^2 + 4 \cdot (-2) \right) \\ &= \underline{\underline{12}} \end{aligned}$$

$$c) \int_{-2}^2 -x^4 + 3x^2 + 4$$

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

$$\begin{aligned} A_0 &= \left(-\frac{1}{5} \cdot 2^5 + 2^3 + 4 \cdot 2 \right) - \\ &\quad \left(-\frac{1}{5} \cdot (-2)^5 + (-2)^3 + 4 \cdot (-2) \right) \\ &= \underline{\underline{19,2}} \end{aligned}$$

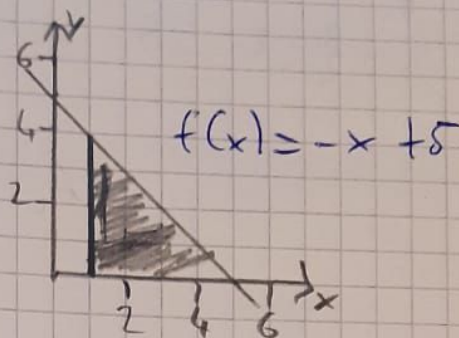
Aufgabe 2



$$\begin{aligned} \int_2^8 -x^2 + 8x \, dx &= \left[-\frac{1}{3}x^3 + 4x^2 \right]_2^8 \\ A_0 &= \left(-\frac{1}{3} \cdot 8^3 + 4 \cdot 8^2 \right) - \left(-\frac{1}{3} \cdot 2^3 + 4 \cdot 2^2 \right) \\ &= \left(-\frac{1}{3} \cdot 512 + 256 \right) - \left(-\frac{1}{3} \cdot 8 + 16 \right) \\ &= \left(-\frac{512}{3} + 256 \right) - \left(-\frac{8}{3} + 16 \right) \\ &= -\frac{512}{3} + 256 - \frac{8}{3} + 16 \\ &= -\frac{520}{3} - \frac{8}{3} + 256 + 16 \\ &= -\frac{528}{3} + 272 \\ &= -176 + 272 \\ &= 96 \end{aligned}$$

Aufgabe 3

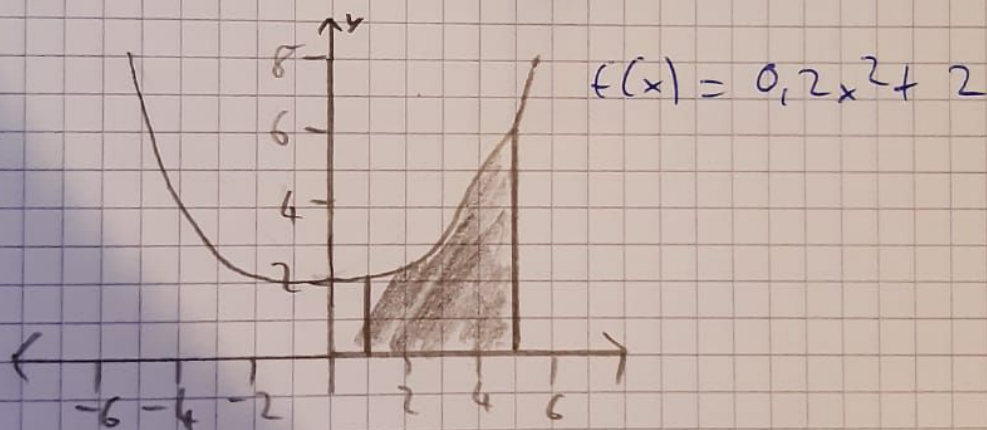
a) $A = \frac{4 \cdot 4}{2} = \underline{\underline{8}}$



b) $\int_1^5 0,2x^2 + 2 \, dx = \left[\frac{0,2}{3} x^3 + 2x \right]_1^5$

$$A_0 = \left(\frac{0,2}{3} \cdot 5^3 + 2 \cdot 5 \right) - \left(\frac{0,2}{3} \cdot 1^3 + 2 \cdot 1 \right)$$

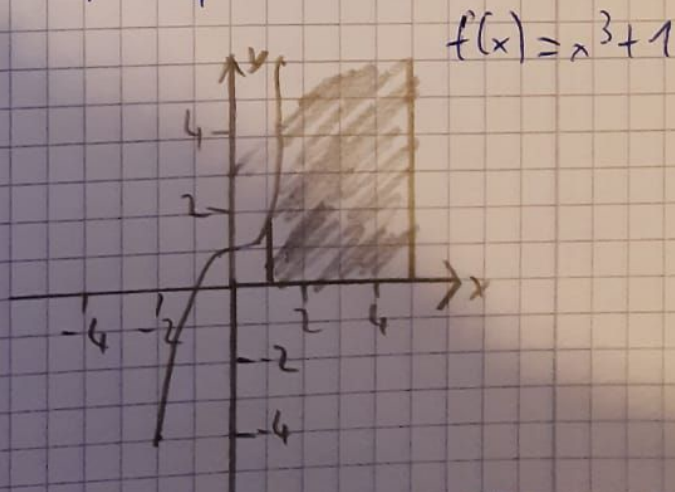
$$= \underline{\underline{16,26}}$$



c) $\int_1^5 x^3 + 1 \, dx = \left[\frac{1}{4} x^4 + x \right]_1^5$

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

$$= \underline{\underline{160}}$$



$$\begin{aligned}
 d) \int_1^5 -\frac{3}{4}x^2 + 27 \, dx &= \left[-\frac{3}{12}x^3 + 27x \right]_1^5 \\
 &= \left[-\frac{1}{4}x^3 + 27x \right]_1^5 \\
 A_0 &= \left(-\frac{1}{4} \cdot 5^3 + 27 \cdot 5 \right) - \\
 &\quad \left(-\frac{1}{4} \cdot 1^3 + 27 \cdot 1 \right) \\
 &= \underline{\underline{139}}
 \end{aligned}$$

