Mathe Aufgaben von Klaudian Moszczynski

Aufgabe 1

a) $\int_{1}^{3} \frac{3}{4}x^2+1 \quad dx = \left[\frac{3}{12}x^3+x\right]^2 = \left[\frac{1}{4}x^3+x\right]^2$

$A_0 = \left(\frac{1}{4}\cdot 3^3+3\right) - \left(\frac{1}{4}\cdot 1^3+1\right)$

$= 8{,}5$

b) $\int_{-2}^{1} -x^2-2x+4 \quad dx = \left[-\frac{1}{3}x^3-x^2+4x\right]$

$A_0 = \left(-\frac{1}{3}\cdot 1^3-1^2+4\cdot 1\right) - \left(-\frac{1}{3}\cdot(-2)^3-(-2)^2+4\cdot(-2)\right)$

$= 12$

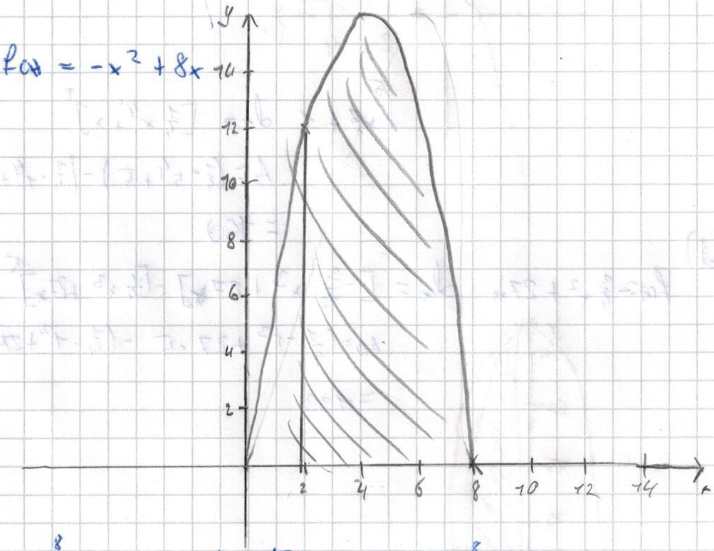
c) $\int_{-2}^{2} -x^4+3x^2+4 \quad dx = \left[-\frac{1}{5}x^5+x^3+4x\right]^2$

$A_0 = \left(-\frac{1}{5}\cdot 2^5+2^3+4\cdot 2\right) - \left(-\frac{1}{5}\cdot(-2)^5+(-2)^3+4\cdot(-2)\right)$

$= 19{,}2$

Aufgabe 2

$f(x) = -x^2+8x$



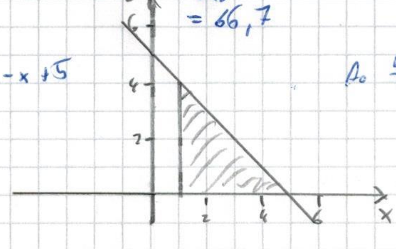
$\int_{2}^{8} -x^2+8x \quad dx = \left[-\frac{1}{3}x^3+4x^2\right]^8$

$A_0 = \left(-\frac{1}{3}\cdot 8^3+4\cdot 8^2\right) - \left(-\frac{1}{3}\cdot 2^3+4\cdot 2^2\right)$

$= 66{,}7$

Aufgabe 3

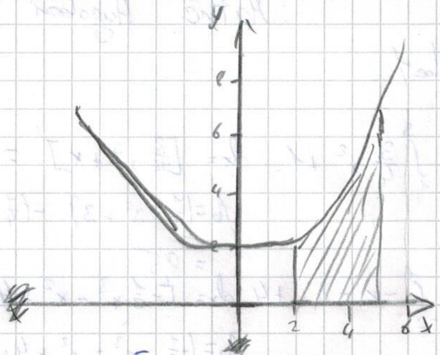
a) $f(x) = -x+5$



$A_0 \ \frac{4\cdot 4}{2} = 8$

b)

$f(x) = 0{,}2x^2 + 2$



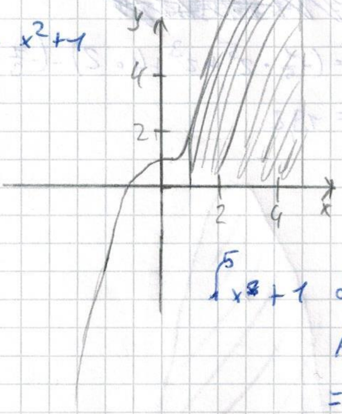
$\int_1^5 0{,}2x^2+2 \; dx = \left[\frac{0{,}2}{3}x + 2x\right]_1^5$

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

$= 16{,}26$

c)

$f(x) = x^2+1$



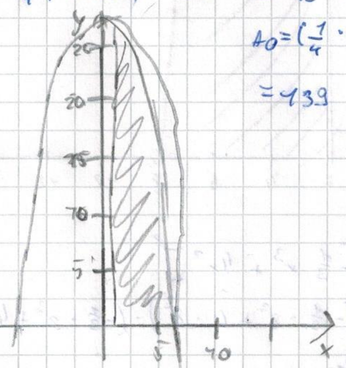
$\int_1^5 x^{\cancel{3}}+1 \; dx = \left[\frac{1}{4}x^4 + x\right]_1^5$

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

$= 160$

d)

$f(x) = -\frac{3}{4}x^2 + 27\cancel{x} \quad dx = \left[-\frac{3}{12}x^3 + 27\cancel{x}\right] = \left[\frac{1}{4}x^3 + 27x\right]_1^5$



$A_0 = \left(\frac{1}{4}\cdot 5^3 + 27\cdot 5\right) - \left(\frac{1}{4}\cdot 1^3 + 27\cdot 1\right)$

$= 139$