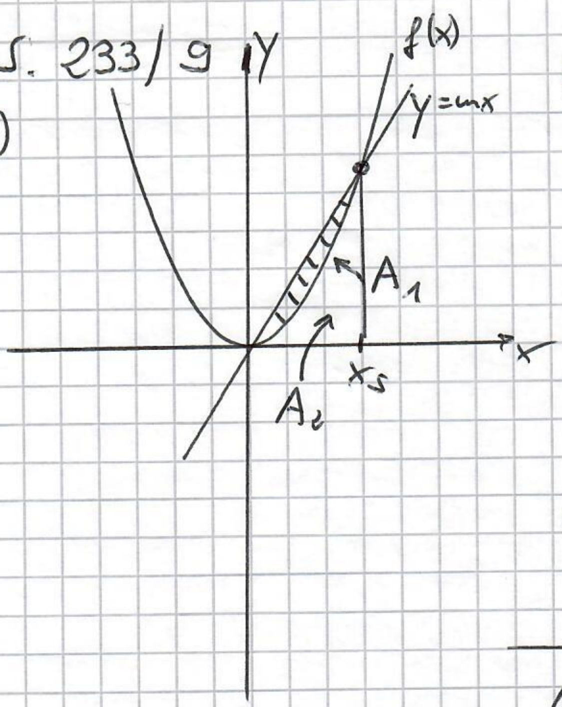
S. 233/9

a)



geg.: $f(x) = x^2$

$y = mx$

ges.: $A_1 = h(m)$

Lös.:

$$A_1 = \int_0^{x_s} mx - x^2 \, dx$$

NR: $mx = x^2 \Leftrightarrow 0 = x^2 - mx$

$0 = x(x - m)$

$x_{s_1} = 0 \qquad \underline{x_{s_2} = m}$

$$A_1 = \int_0^m mx - x^2 \, dx = \underline{\underline{\frac{1}{6}m^3}}$$

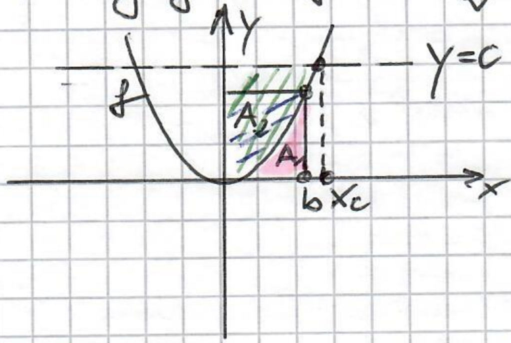
b) $A_1 : A_2$ stehen unabhängig von m im gleichen Verhältnis

$A_1 = \frac{1}{6}m^3 \;\; / \;\; A_2 = \int_0^m x^2 \, dx = \underline{\underline{\frac{1}{3}m^3}}$

$A_1 : A_2 = \frac{1}{6}m^3 : \frac{1}{3}m^3 = \underline{\underline{1 : 2}}$

S. 233/7

a) geg.: $f(x) = \frac{1}{2}x^2$ $A_1 = 288$ FE (rote Fläche)



$$288 = \int_0^b \frac{1}{2}x^2\,dx$$

GTR: SOLVE(288= .. , b)

$\underline{\underline{b = 12}}$

b) geg.: $f(x) = \frac{1}{2}x^2$ $A_2 = 288$ FE (blaue Fläche)

$$288 = \int_0^b \frac{1}{2}b^2 - \frac{1}{2}x^2\,dx$$

GTR: SOLVE(288= .. , b)

$\underline{\underline{b \approx 9{,}52}}$

c) geg.: $f(x) = \frac{1}{2}x^2$, $y = c$ $A_3 = 72$ FE

$$72 = \int_0^{x_c} c - \frac{1}{2}x^2\,dx$$

<u>NR:</u> $f(x) = c$

$\frac{1}{2}x^2 = c \wedge x^2 = 2c$

$x_{1,2} = \underline{\underline{\pm\sqrt{2c}}} = x_{c_{1,2}}$

$$72 = \int_0^{\sqrt{2c}} c - \frac{1}{2}x^2\,dx$$

GTR: SOLVE(72= ... , c)

$\underline{\underline{c = 18}}$