

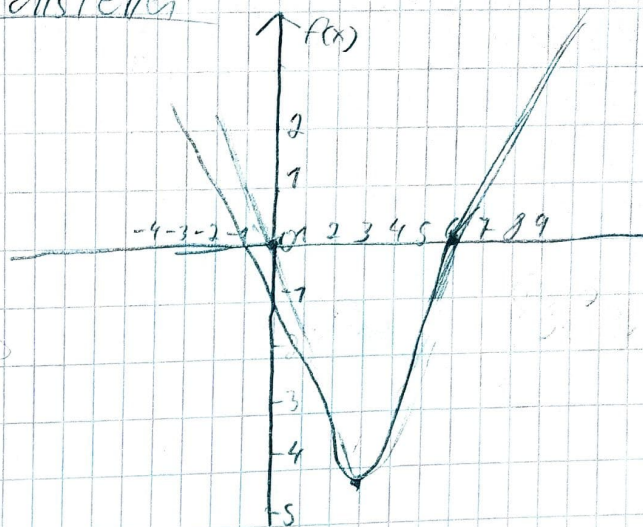
# Hausaufgaben 27.03.2020

## Nullstellen

Hendrik  
Heinz

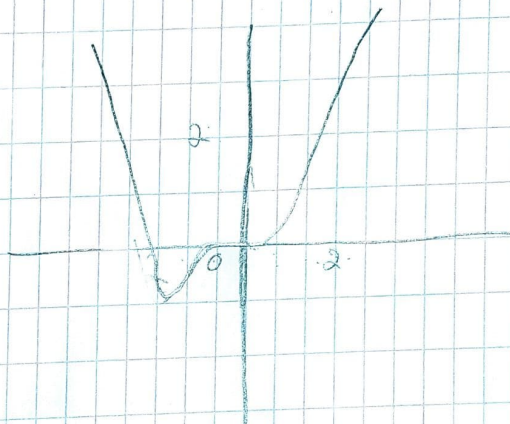
$$\begin{aligned} a) f(x) &= \frac{1}{2}x^2 - 3x = 0 \\ &= 0,5x^2 - 3x = 0 \\ (0,5x - 3) \cdot x &= 0 \\ 0,5x - 3 &= 0 \quad | +3 \\ 0,5x &= 3 \quad | :0,5 \end{aligned}$$

$$x = 6 \quad x = 0 \quad (0; 6)$$



$$\begin{aligned} b) f(x) &= \frac{1}{2}x^4 + x^3 \\ 0,5x^4 + x^3 &= 0 \quad | :x^3 \\ (0,5x + 1) \cdot x^3 &= 0 \\ 0,5x + 1 &= 0 \quad | -1 \\ 0,5x &= -1 \quad | :0,5 \\ x &= -2 \end{aligned}$$

$$(-2; 0)$$



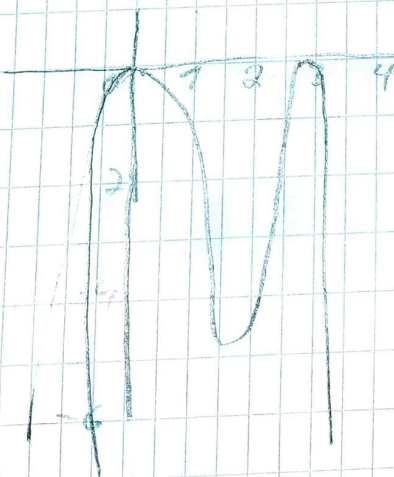
$$\begin{aligned} c) f(x) &= -x^4 + 6x^3 - 9x^2 \\ (-x^2 + 6x - 9) \cdot x^2 &= 0 \\ -x^2 + 6x - 9 &= 0 \quad | +9 \\ -x^2 + 6x &= 9 \quad | : -1 \\ x^2 - 6x &= -9 \\ x^2 - 6x + (-3)^2 &= (-3)^2 - 9 \\ x^2 - 6x + (-3)^2 &= 9 - 9 \\ &= 0 \end{aligned}$$

$$(x-3)^2 = 0$$

$$x-3 = \sqrt{0}$$

$$x-3 = 0$$

$$x = 3 \quad (0; 3)$$





## Nullstellen

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

$$0,5x^2 - \frac{1}{2}x - 3 = 0 \quad | +3$$

$$0,5x \cdot x^2 - 0,5x = 3 \quad | :0,5$$

$$x^2 - x = 6$$

$$x^2 - x + \left(-\frac{1}{2}\right)^2 = \left(-\frac{1}{2}\right)^2 + 6$$

$$x^2 - x + \left(-\frac{1}{2}\right)^2 = \left(-0,5\right)^2 + 6$$

$$x^2 - x + \left(-\frac{1}{2}\right)^2 = 0,25 + 6$$

$$x^2 - x + \left(\frac{1}{2}\right)^2 = 6,25$$

$$(x - \frac{1}{2})^2 = 6,25$$

$$x - \frac{1}{2} = \pm \sqrt{6,25}$$

$$x_1 - 0,5 = \sqrt{6,25}$$

$$x_2 - \frac{1}{2} = -\sqrt{6,25}$$

$$x_1 - 0,5 = 2,5$$

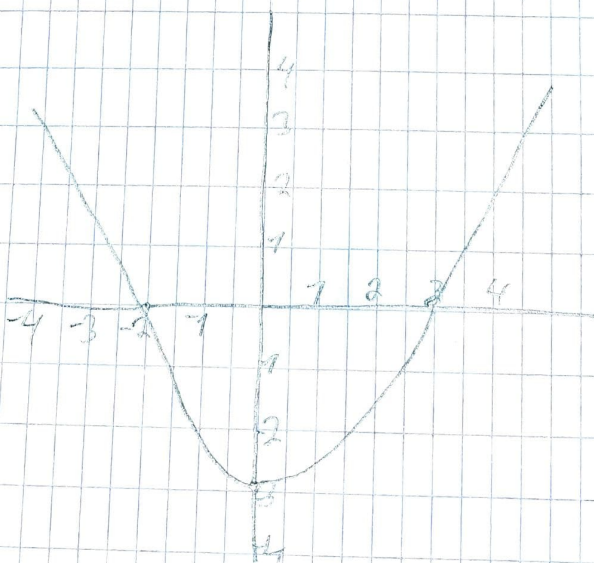
$$x_2 - 0,5 = -\sqrt{6,25}$$

$$x_1 = 3$$

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

$$x_2 = -2$$

$$(-2; 3)$$



Hausaufgabe 27.03.20  
Flächeninhalt

Hendrik  
Heinz

$$\begin{aligned} a.) \int_0^6 \left(\frac{1}{3}x^2 - 3x\right) dx & \left[ \frac{0,5}{3}x^3 - \frac{3}{2}x^2 + c \right]_0^6 \\ & \frac{0,5}{3} \cdot 6^3 - \frac{3}{2} \cdot 6^2 + c - \left( \frac{0,5}{3} \cdot 0^3 - \frac{3}{2} \cdot 0^2 + c \right) \\ & (36 - 54) - (0 - 0) \\ & -18 - 0 = -18 \text{ FE} \end{aligned}$$

$$\begin{aligned} b.) \int_0^{-2} \left(\frac{1}{2}x^4 + x^3\right) dx & \left[ \frac{0,5}{5}x^5 + \frac{1}{4}x^4 \right]_0^{-2} \\ & \left( \frac{0,5}{5} \cdot (-2)^5 + \frac{1}{4}(-2)^4 \right) - \left( \frac{0,5}{5} \cdot 0^5 + \frac{1}{4} \cdot 0^4 \right) \\ & \frac{4}{5} - 0 = \frac{4}{5} \text{ FE} \end{aligned}$$

$$\begin{aligned} c.) \int_3^0 (-x^4 + 6x^3 - 9x^2) dx & \left[ -\frac{1}{5}x^5 + \frac{6}{4}x^4 - \frac{9}{3}x^3 + c \right]_3^0 \\ & -8,1 - 0 = 8,1 \text{ FE} \end{aligned}$$