Woche 2 Corona

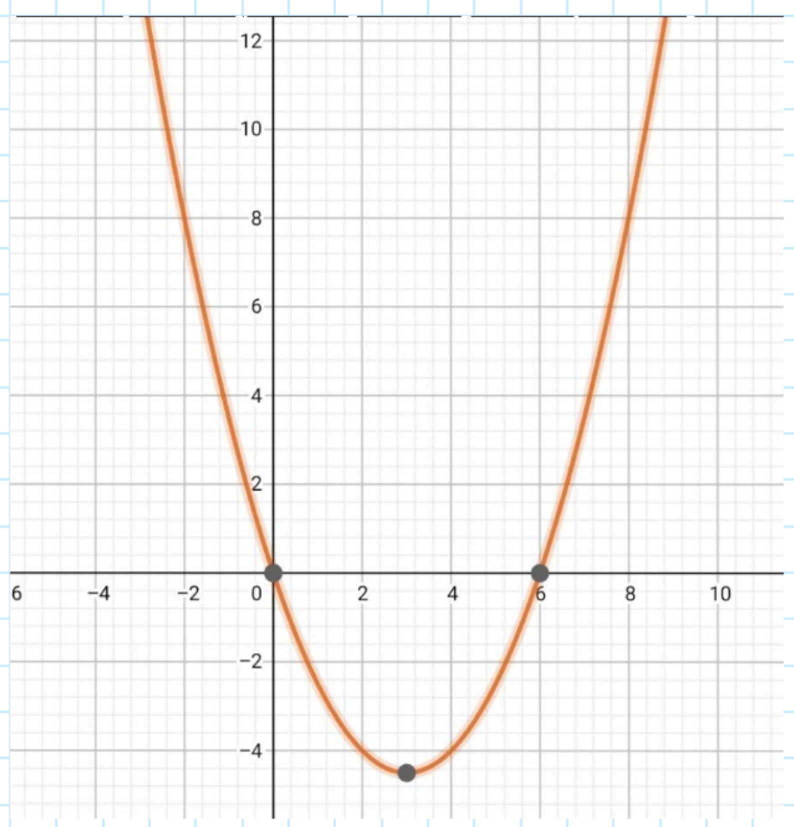
Freitag, 27. März 2020 11:08

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

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

$\frac{6}{2} \pm \sqrt{\left(\frac{-6}{2}\right)^2 + 0}$

$x_1 = 0 \qquad x_2 = 6$



$\int_0^6 \left(\frac{1}{2}x^2 - 3x\right) dx \quad \left[\frac{0{,}5}{3}x^3 - \frac{3}{2}x^2 + c\right]_0^6$

$\frac{0{,}5}{3}\cdot 6^3 - \frac{3}{2}\cdot 6^2 + \cancel{c} - \frac{0{,}5}{3}0^3 - \frac{3}{2}0^2 + \cancel{c}$

$(36 - 54) - (0 - 0)$

$-18 - 0 = -18\,FE$

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

$f(x) = \left(\frac{1}{2}x + 1\right)\cdot x^3 = 0$

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

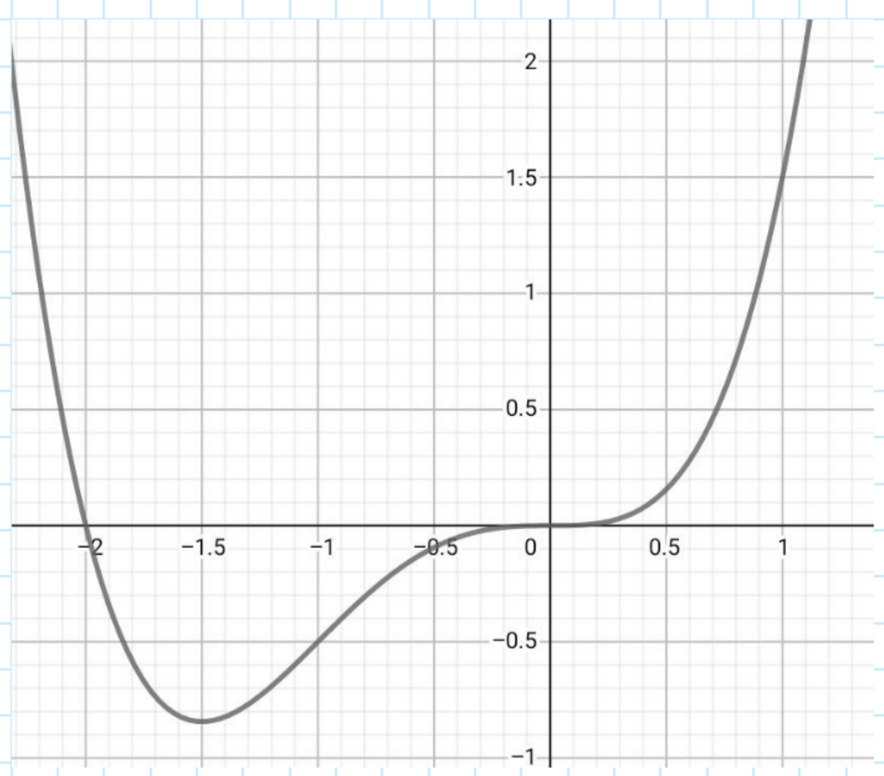
$\frac{1}{2}x = -1 \quad |:\frac{1}{2}$

$x = -2$

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

$x = 0$

$x_1 = 0 \qquad x_2 = -2$



$\int_0^{-2} \left(\frac{1}{2}x^4 + x^3\right) dx \quad \left[\frac{0{,}5}{5}x^5 + \frac{1}{4}x^4\right]_0^{-2}$

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

$(-3{,}2 + 4) - (0 + 0)$

$\frac{4}{5} - 0 = \frac{4}{5}\,FE$

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

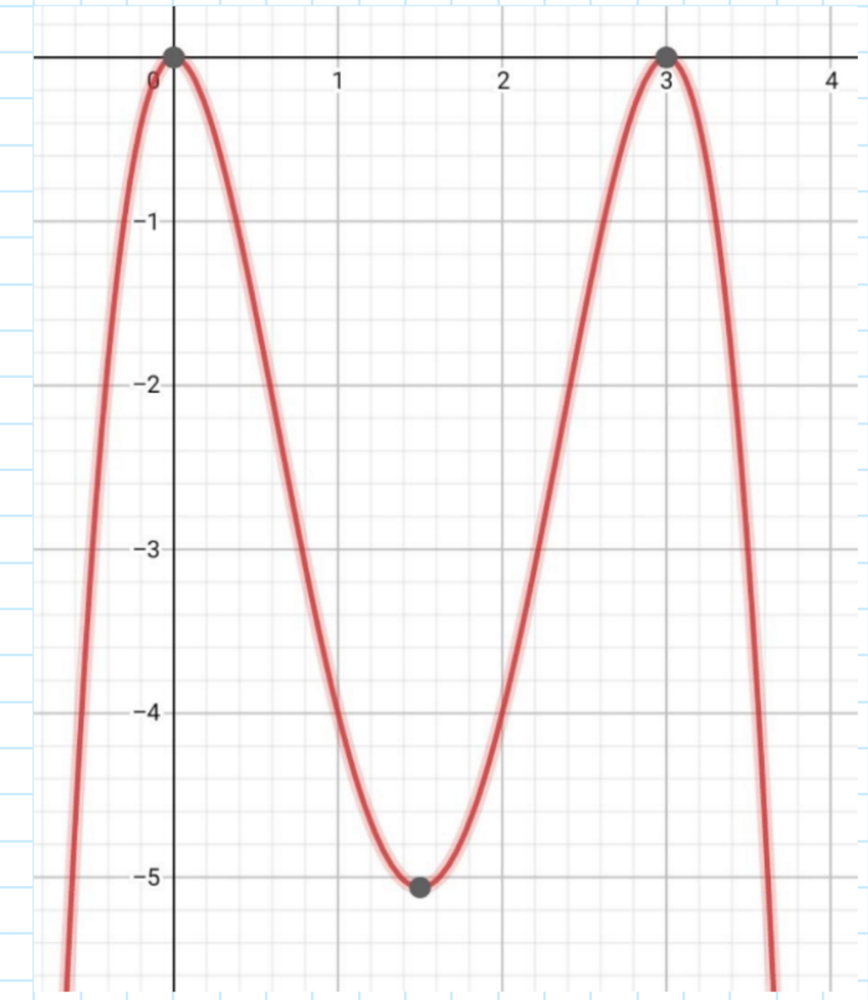
$f(x) = x^2\left(-x^2 + 6x - 9\right) \quad |\cdot(-1)$

$f(x) = -x^2\cdot\left(x^2 - 6x + 9\right)$

da eine Null eingesetzt ergibt 0

$\frac{6}{2} \pm \sqrt{\left(-\frac{6}{2}\right)^2 - 9}$

$x_1 = 3 \qquad x_2 = 3 \qquad x_3 = 0 \qquad x_4 = 0$



$\int_3^0 \left(-x^4 + 6x^3 - 9x^2\right) dx \quad \left[\frac{-1}{5}x^5 + \frac{6}{4}x^4 - \frac{9}{3}x^3 + c\right]_3^0$

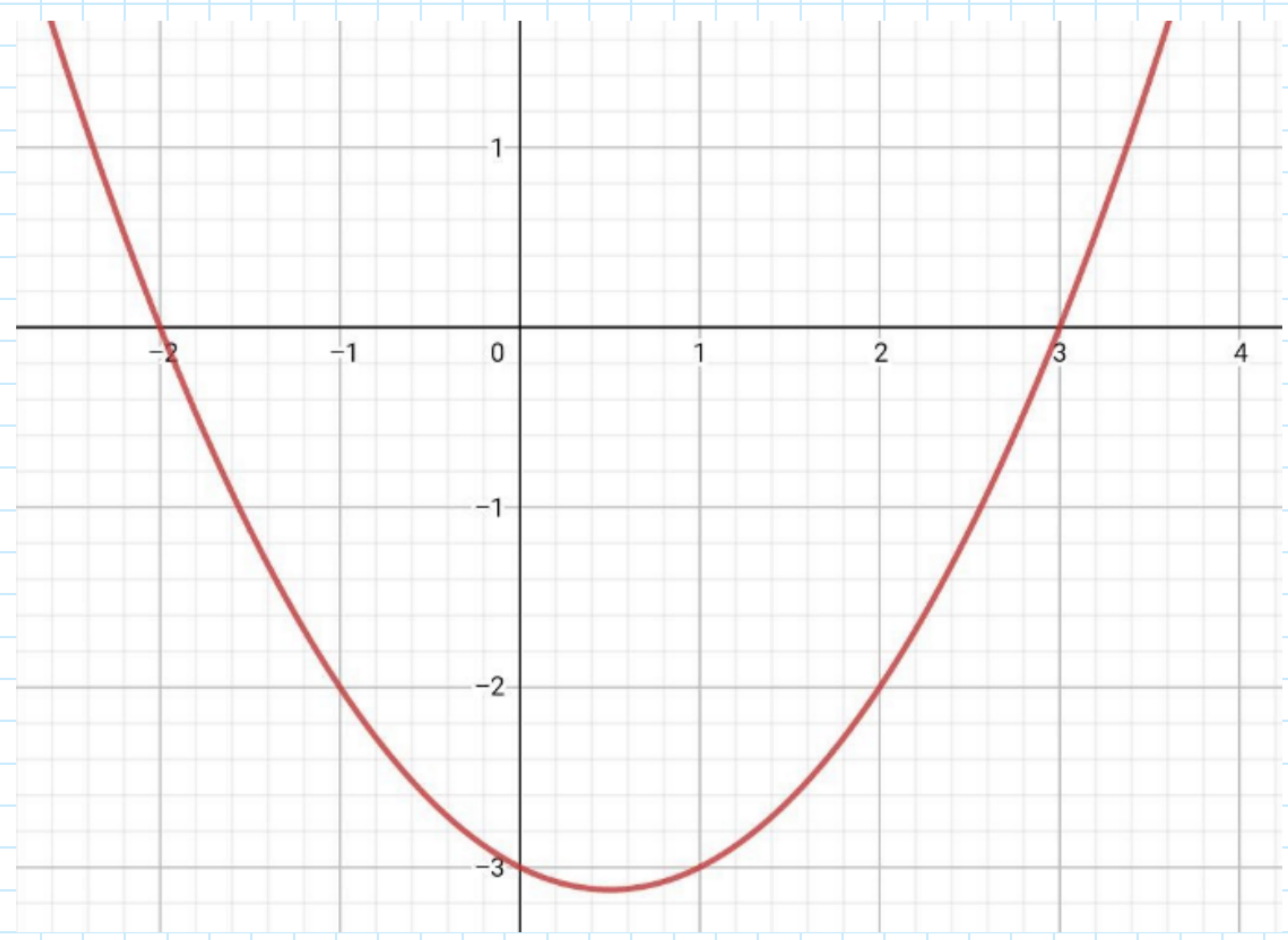
$-8{,}1 - 0 = -8{,}1\,FE$

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

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

$\frac{1}{2} \pm \sqrt{\left(\frac{-1}{2}\right)^2 + 6}$

$x_1 = 3 \qquad x_2 = -2$



$\int_3^{-2} \left(\frac{1}{2}x^2 - \frac{1}{2}x - 3\right) dx \quad \left[\frac{0{,}5}{3}x^3 - \frac{0{,}5}{2}x^2 - 3x + c\right]_3^{-2}$

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

$13{,}17 - (-38{,}08) = 24{,}91\,FE$