Aufgabe 6

$$f(x) = x^2 - 3 \qquad m = \frac{y_2 - y_1}{x_2 - x_1}$$

a)

$$\begin{aligned} m &= \frac{f(-1) - f(-100)}{-1 - (-100)} \\ &= \frac{(-1)^2 - 3 - \left((-100)^2 - 3\right)}{99} \\ &= \frac{1 - 3 - (10000 - 3)}{99} \\ &= \frac{-2 - 9997}{99} \\ &= \frac{-9999}{99} = -101 \end{aligned}$$

b)

$$\begin{aligned} m &= \frac{f(-1) - f(-10)}{-1 - (-10)} \\ &= \frac{(-1)^2 - 3 - \left((-10)^2 - 3\right)}{9} \\ &= \frac{1 - 3 - (100 - 3)}{9} \\ &= \frac{-2 - 97}{9} \\ &= \frac{-99}{9} = -11 \end{aligned}$$

c)

$$\begin{aligned} m &= \frac{f(-1) - f(-1{,}1)}{-1 - (-1{,}1)} \\ &= \frac{(-1)^2 - 3 - \left((-1{,}1)^2 - 3\right)}{0{,}1} \\ &= \frac{1 - 3 - (1{,}21 - 3)}{0{,}1} \\ &= \frac{-2 + 1{,}79}{0{,}1} \\ &= \frac{-0{,}21}{0{,}1} = -2{,}1 \end{aligned}$$

d)

$$\begin{aligned} m &= \frac{f(-1) - f(-1{,}01)}{-1 - (-1{,}01)} \\ &= \frac{(-1)^2 - 3 - \left((-1{,}01)^2 - 3\right)}{0{,}01} \\ &= \frac{1 - 3 - (1{,}0201 - 3)}{0{,}01} \\ &= \frac{-2 + 1{,}9799}{0{,}01} \\ &= \frac{-0{,}0201}{0{,}01} = -2{,}01 \end{aligned}$$