

FA1.9 – Funktionstypen (Lösungen)

Lösungen Maturaaufgaben:

- 1) Gehe zum Aufgabenpool Mathematik AHS: <https://prod.aufgabenpool.at/amn/index.php?id=M>
- 2) Gib im Feld „**Volltextsuche**“ die **Nummer** ein. Du kommst zur zugehörigen Aufgabe. Die Lösungen sind bei der Aufgabe enthalten.

Grundkompetenz

Aufgabentyp ▾

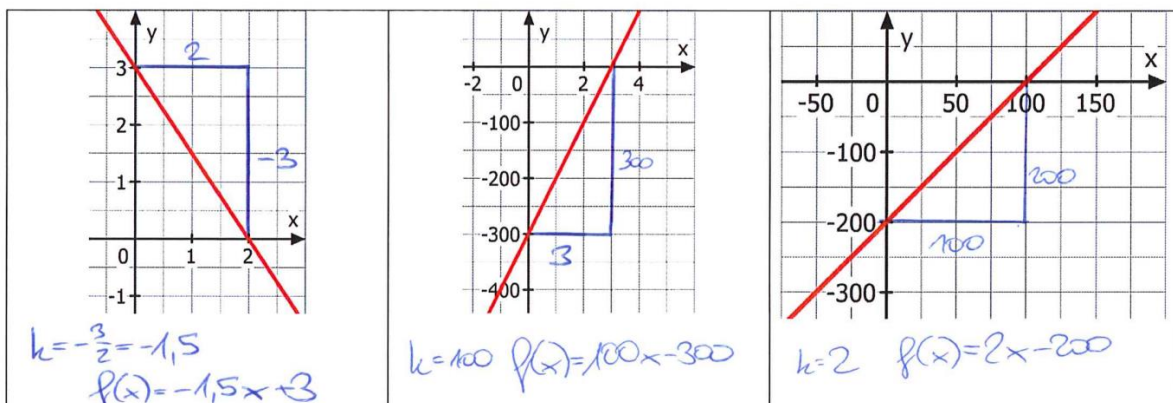
Schulstufe ▾

Volltextsuche

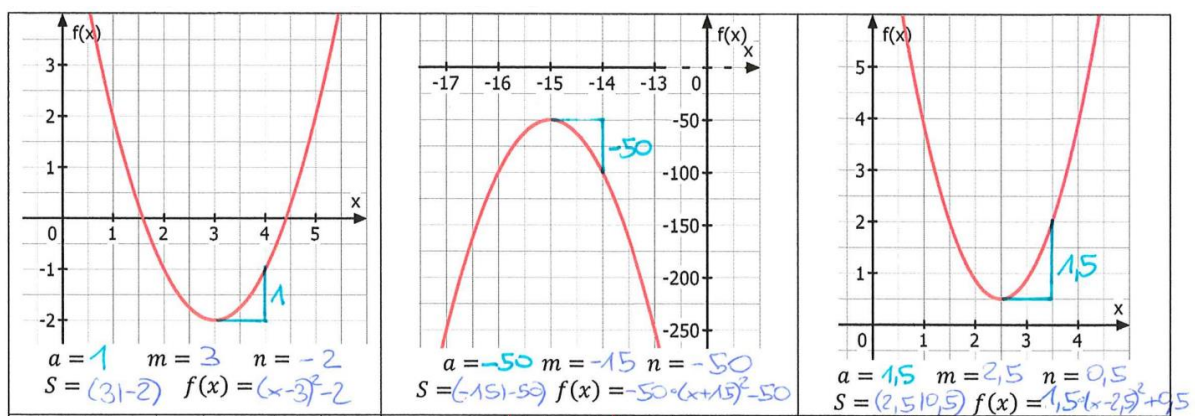
Angestelltegehalt* 1_578, AN1.1, Offenes Antwortformat

↑
Nummer

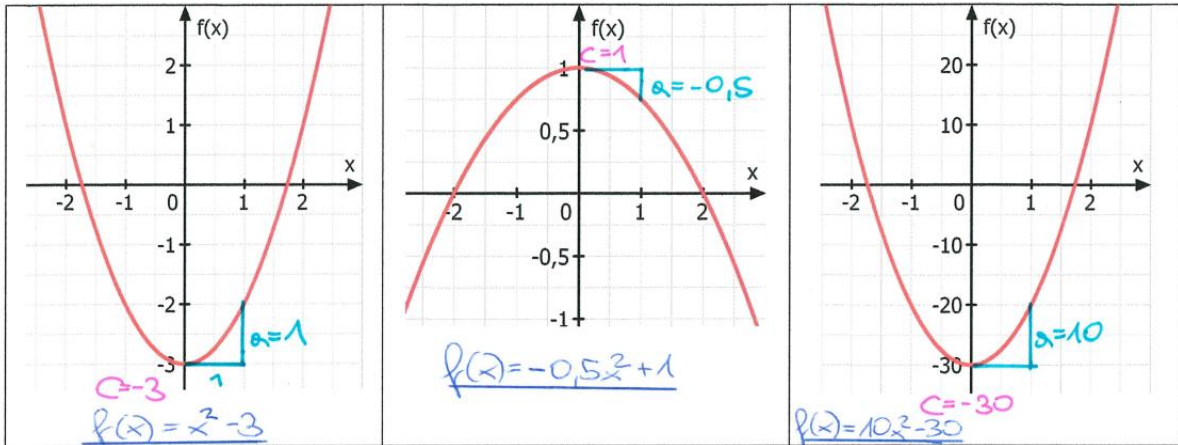
Bsp. 1)



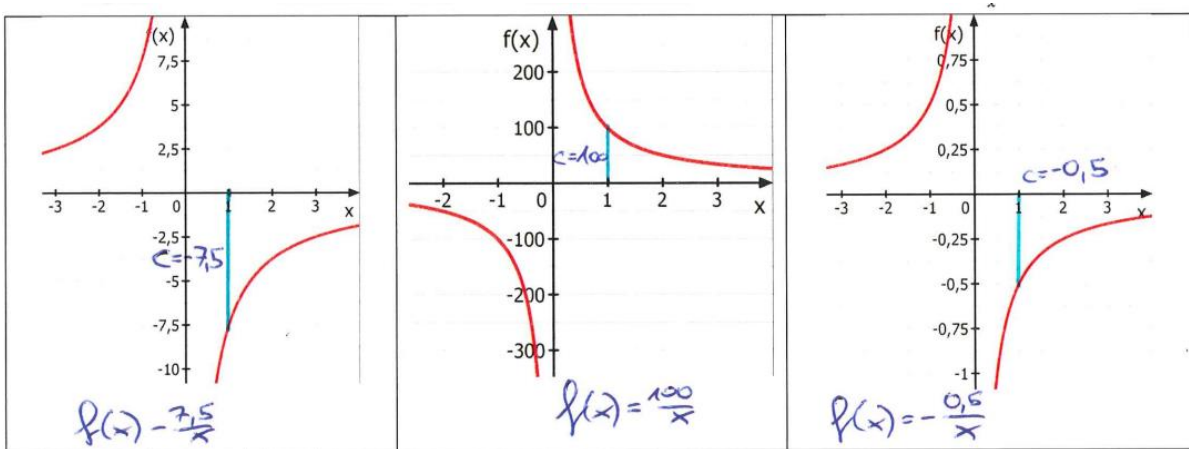
Bsp. 2)



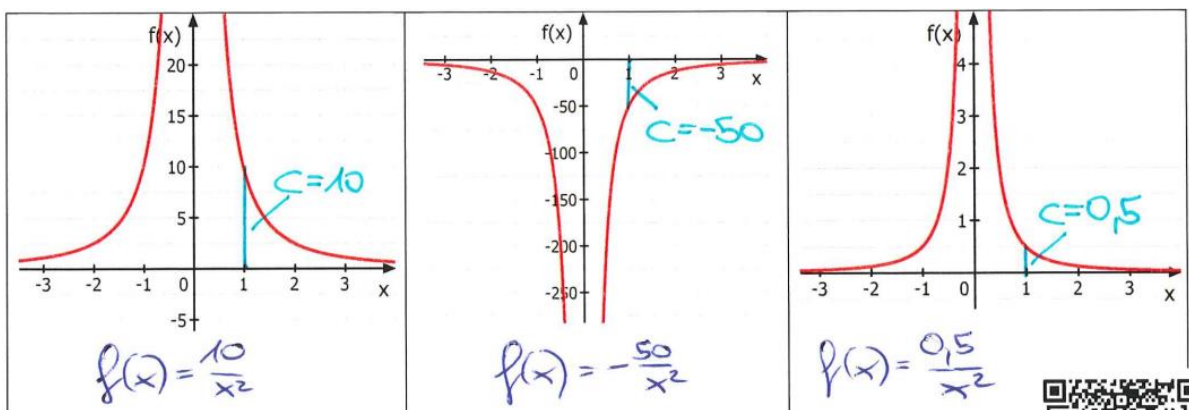
Bsp. 3)



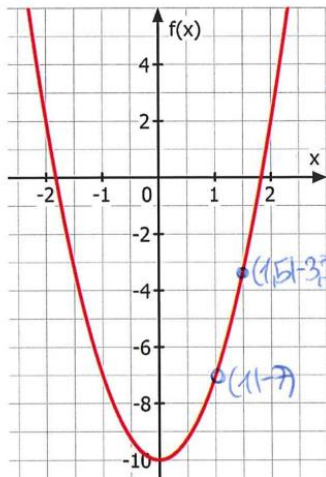
Bsp. 4)



Bsp. 5)



Bsp. 6)



$\circ x^2, x^4, x^6$
 ① $f(x) = ax^2 - 10$
 $-7 = a \cdot 1^2 - 10 \quad | +10$
 $3 = a \cdot 1 \Leftrightarrow \underline{a=3}$

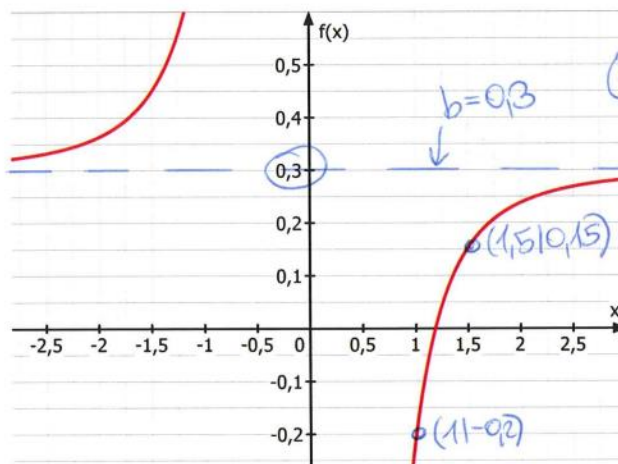
② $f_1(x) = 3x^2 - 10$
 $f_1(1.5) \approx -3.3 \checkmark$

$f_2(x) = 3 \cdot x^4 - 10$ $f_3(x) = 3 \cdot x^6 - 10$
 $f_2(1.5) \approx 5.2$ $f_3(1.5) \approx 24.2$

$f(x) = 3x^2 - 10$



Video 3/5



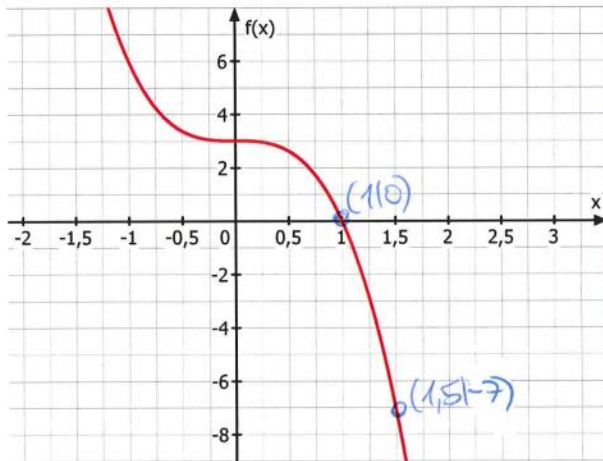
$\circ x^{-1}, x^{-3}, x^{-5}$
 ① $f(x) = a \cdot x^{-1} + 0.3$
 $-0.2 = a \cdot 1^{-1} + 0.3 \quad | -0.3$
 $-0.5 = a$

② $f_1(x) = -0.5x^{-1} + 0.3$
 $f_1(1.5) \approx -0.03$

$f_2(x) = -0.5x^{-3} + 0.3$
 $f_2(1.5) \approx 0.15$

$f_3(x) = -0.5x^{-5} + 0.3$
 $f_3(1.5) \approx 0.23$

$f(x) = -0.5x^{-1} + 0.3$

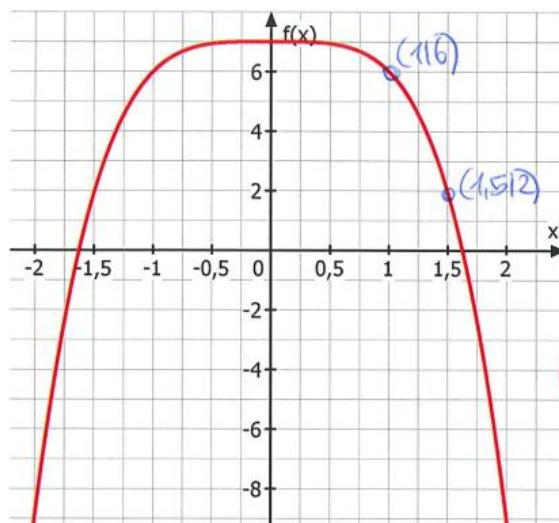


$\circ x^3, x^5$
 ① $f(x) = a \cdot x^3 + 3$
 $0 = a \cdot 1^3 + 3 \quad | -3$
 $-3 = a$

② $f_1(x) = -3x^3 + 3$
 $f_1(1.5) = -7.125$

$f_2(x) = -3x^5 + 3$
 $f_2(1.5) \approx -19.7$

$f(x) = -3x^3 + 3$



$\circ x^2, x^4, x^6$

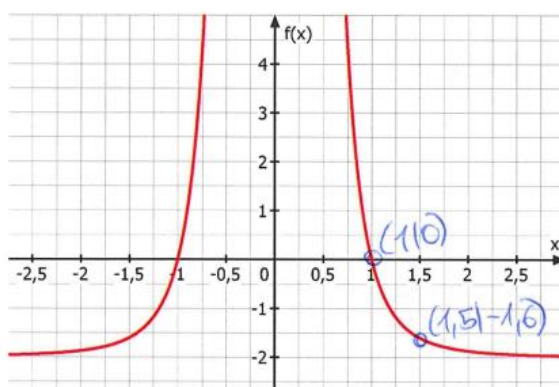
① $p(x) = a \cdot x^2 + 7$
 $6 = a \cdot 1^2 + 7 \quad | -7$
 $-1 = a$

② $p_1(x) = -x^2 + 7$
 $p_1(1,5) \approx 4,75$

$p_2(x) = -x^4 + 7$
 $p_2(1,5) \approx 1,94$

$p(x) = -x^4 + 7$

$p_3(x) = -x^6 + 7$
 $p_3(1,5) \approx -4,39$



$\circ x^{-2}, x^{-4}, x^{-6}$

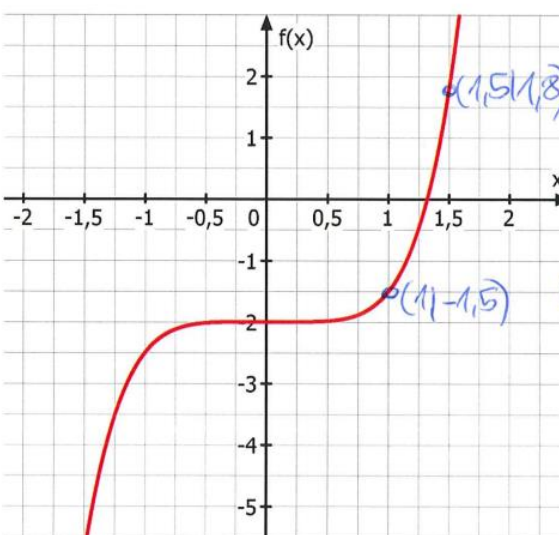
① $p(x) = a \cdot x^{-2} - 2$
 $0 = a \cdot 1^2 - 2 \quad | +2$
 $2 = a$

② $p_1(x) = 2 \cdot x^{-2} - 2$
 $p_1(1,5) \approx -1,1$

$p_2(x) = 2 \cdot x^{-4} - 2$
 $p_2(1,5) \approx -1,6$

$p_3(x) = 2 \cdot x^{-6} - 2$
 $p_3(1,5) \approx -1,8$

$p(x) = 2 \cdot x^{-4} - 2$



$\circ x^3, x^5$

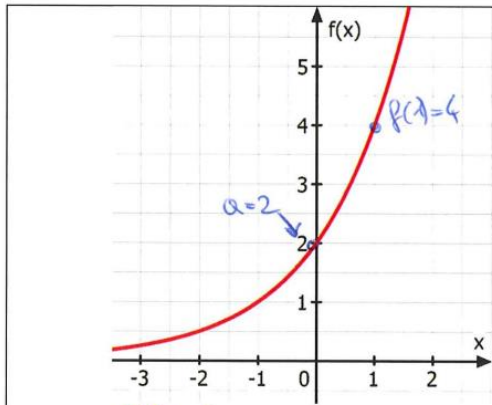
① $p(x) = a \cdot x^3 - 2$
 $-1,5 = a \cdot 1^3 - 2 \quad | +2$
 $0,5 = a$

② $p_1(x) = 0,5 \cdot x^3 - 2$
 $p_1(1,5) \approx -0,3$

$p_2(x) = 0,5 \cdot x^5 - 2$
 $p_2(1,5) \approx 1,8$

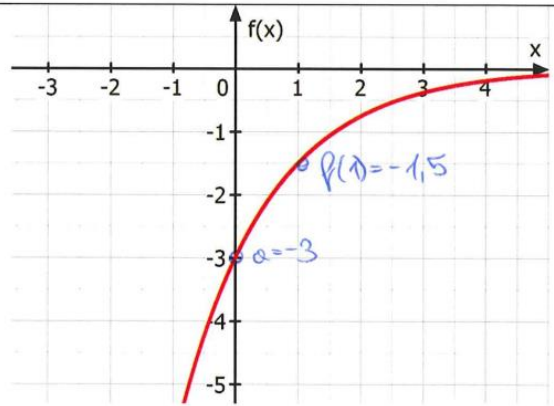
$p(x) = 0,5 \cdot x^5 - 2$

Bsp. 7)



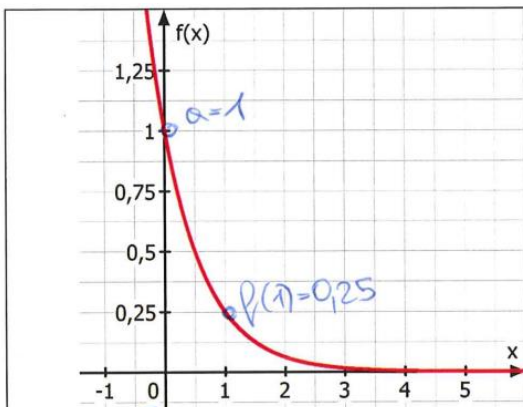
$$b = \frac{f(1)}{a} = \frac{4}{2} = 2$$

$$f(x) = 2 \cdot 2^x$$



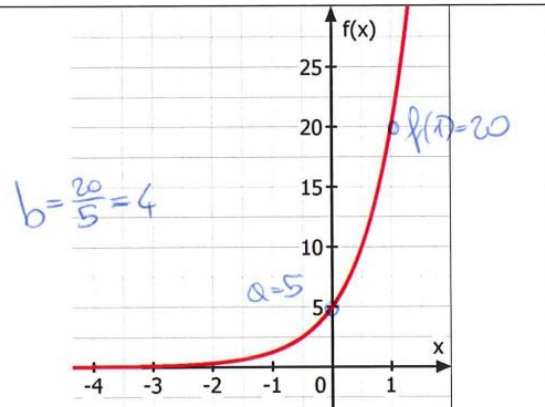
$$b = \frac{-1.5}{-3} = \frac{1}{2} = 0.5$$

$$f(x) = -3 \cdot 0.5^x$$



$$b = \frac{0.25}{1} = 0.25$$

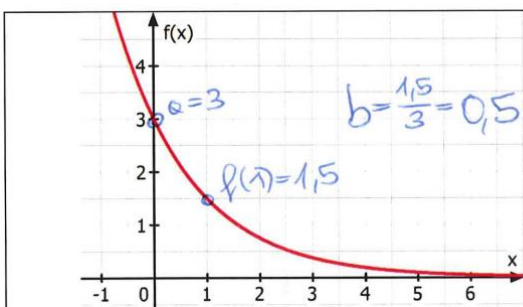
$$f(x) = 1 \cdot 0.25^x$$



$$b = \frac{20}{5} = 4$$

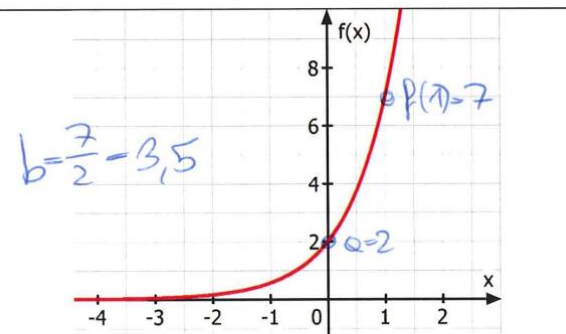
$$f(x) = 5 \cdot 4^x$$

Bsp. 8)



$$\lambda = \ln b = -0.67$$

$$f(x) = 3 \cdot e^{-0.67x}$$



$$\lambda = \ln(3.5) \approx 1.25$$

$$f(x) = 2 \cdot e^{1.25x}$$

Bsp. 9)

