

# Algebra 2 Test 5.1 Review

# Answer Key for Review

$$\begin{aligned} \textcircled{1} \quad 4^{2x-1} &= 64^{5x/6} \\ (2^2)^{2x-1} &= (2^6)^{5x/6} \\ 2(2x-1) &= 6\left(\frac{5x}{6}\right) \\ 4x-2 &= 5x \\ \boxed{x &= -2} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad 5^x &= 12 \\ \log_5(12) &= x \\ \boxed{x &= 1.544} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad 9^x &= 27^{x-2} \\ (3^2)^x &= (3^3)^{x-2} \\ 2x &= 3(x-2) \\ 2x &= 3x-6 \\ \boxed{x &= 6} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad 12^{x-4} &= 8 \\ \log_{12}(8) &= x-4 \\ \boxed{x &= 4.837} \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad \log_2(x+5) &= 9 \\ 2^9 &= x+5 \\ \boxed{x &= 507} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad 24^{3x+2} &= 27 \\ \log_{24}(27) &= 3x+2 \\ \boxed{x &= -0.321} \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad \ln(5x-3) &= 5 \\ e^5 &= 5x-3 \\ e^5+3 &= 5x \\ \frac{e^5+3}{5} &= x \\ \boxed{x &\approx 30.283} \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad \log_4(2x) &= 7 + \log_4(3) \\ \log_4(2x) - \log_4(3) &= 7 \\ \log_4\left(\frac{2x}{3}\right) &= 7 \\ 4^7 &= 2x/3 \\ 3 \cdot 4^7 &= 2x \\ \boxed{x &= 24,576} \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad \ln(7) - \ln(x) &= 3 \\ \ln\left(\frac{7}{x}\right) &= 3 \\ x \cdot e^3 &= \frac{7}{x} \cdot x \\ \frac{x \cdot e^3}{e^3} &= \frac{7}{e^3} \\ \boxed{x &\approx 0.349} \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad 2 \log(x) + \log(4) &= 2 \\ \log(x)^2 + \log(4) &= 2 \\ \log(4x^2) &= 2 \\ 10^2 &= 4x^2 \\ 25 &= x^2 \\ \boxed{x &= 5} \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad \log_6(x-5) + \log_6(x) &= 2 \\ \log_6 x(x-5) &= 2 \\ \log_6 x^2 - 5x &= 2 \\ 6^2 &= x^2 - 5x \\ 0 &= x^2 - 5x - 36 \\ (x-9)(x+4) &= 0 \\ x=9 \quad x &= -4 \\ \boxed{x &= 9} \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad A &= Pe^{rt} \\ &= 4750e^{(0.045)(6)} \\ &= \$6222.33 \end{aligned}$$

$$\begin{aligned} \textcircled{13} \quad y &= Pe^{rt} \\ &= 6000e^{(0.05)(x)} \\ \boxed{x &\approx 10.2 \text{ years}} \end{aligned}$$

$$\textcircled{14} \quad f(x) = -\left(\frac{3}{4}\right)^x + 5$$

$$\textcircled{16} \quad h(x) = -2^{x-7}$$

$$\begin{aligned} \textcircled{17} \quad y &= a(0.5)^x \\ &= 105(0.5)^{75/113} \\ \boxed{y &= 66.3 \text{ mg}} \end{aligned}$$

$$\begin{aligned} \textcircled{18} \quad y &= a(0.5)^x \\ &= 240(0.5)^{x/4} \\ \boxed{x &\approx 11 \text{ years}} \end{aligned}$$

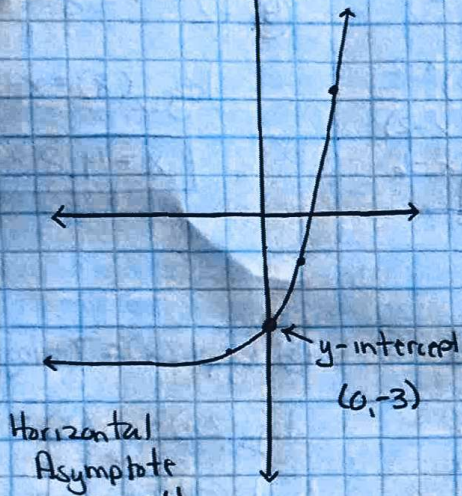
$\textcircled{19}$  Horizontal Asymptote  $y=1$

$\textcircled{20}$  Vertical Asymptote  $x=-5$

$\textcircled{21}$  Horizontal Asymptote  $y=0$

Graphen für Funktionen

(22)  $f(x) = e^x - 4$



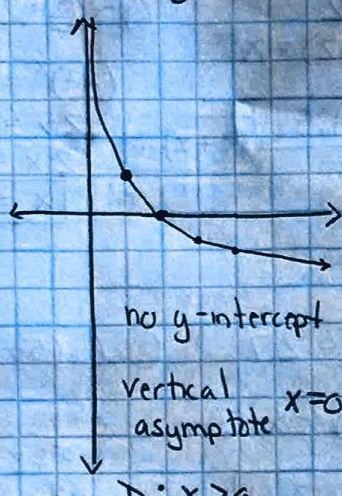
Horizontal Asymptote  $y = -4$

y-intercept  $(0, -3)$

$D: \mathbb{R}$

$R: y > -4$

(23)  $f(x) = -\log_2(x) + 1$



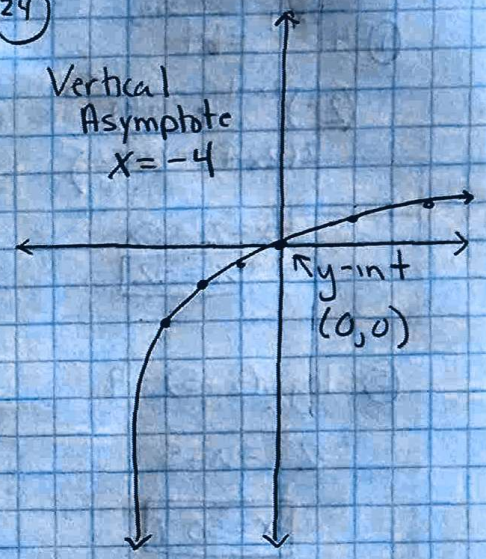
no y-intercept

vertical asymptote  $x = 0$

$D: x > 0$

$R: \mathbb{R}$

(24)



Vertical Asymptote  $x = -4$

x-intercept  $(0, 0)$

$D: x > -4$

$R: \mathbb{R}$