# Repetition Exponentialfunktion

Bestimmen Sie x:

1. $4^x = 16$

   $4^2 = 16\ also\ 4^x = 4^2$ $\qquad$ $Exponentenvergleich$

   $x = 2$

2. $4^{2x} = 256$

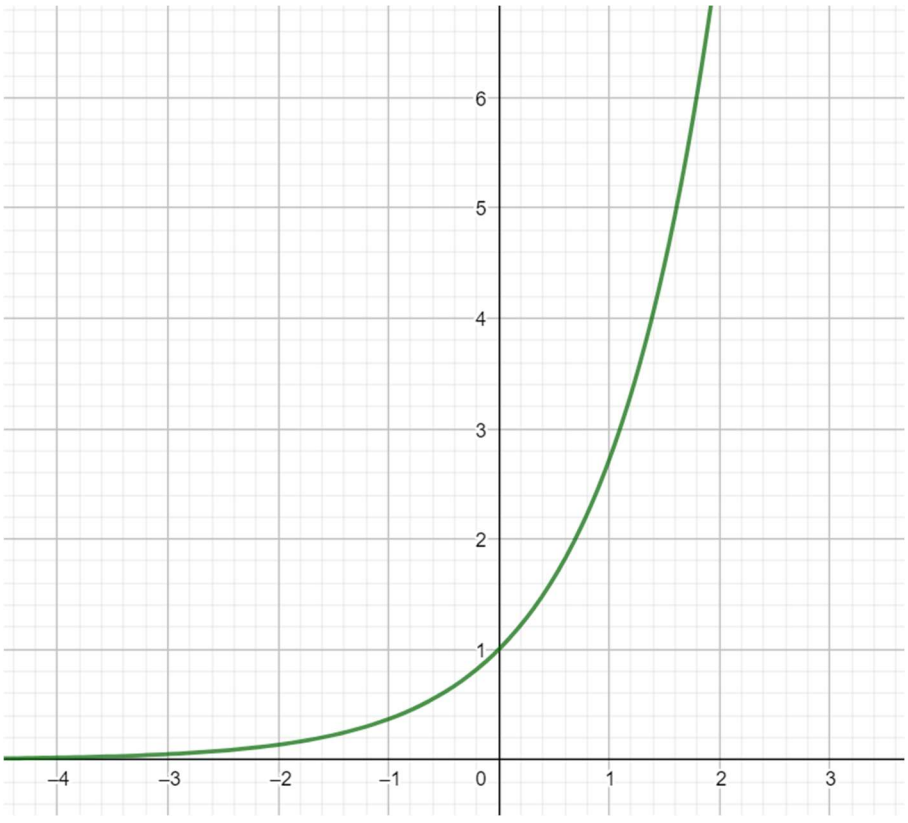
   $4^4 = 256\ also\ 4^{2x} = 4^4$ $\qquad$ $Exponentenvergleich$

   $2x = 4 \qquad : 2$

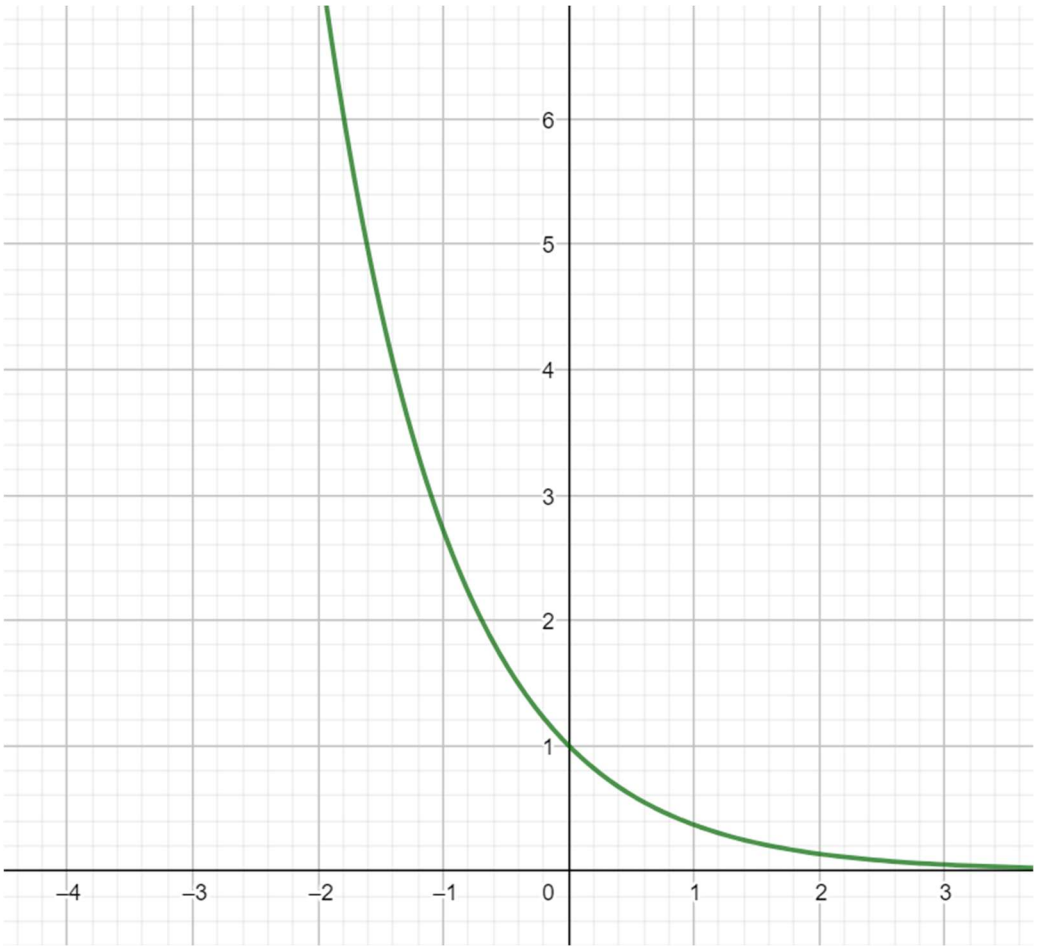
   $x = 2$

Zeichnen Sie den Graphen von

3. $f(x) = e^x$



4. $f(x) = e^{-x}$




5. Wenn $e^x = 2^x = 10^x$ ist,
   dann ist $x$ =0

6. Bestimmen Sie x für $2^{5x-3} = 512$

   $2^9 = 512\ also\ 2^{5x-3} = 2^9$ $\quad Exponentenvergleich$

   $5x - 3 = 9$ $\quad + 3$

   $5x = 8 + 3 = 12$ $\quad : 5$

   $x = \frac{12}{5}$

7. Bestimmen Sie x für $\sqrt{a^{x-3}} = \sqrt[3]{a^{x+2}}$

$a^{\frac{x-3}{2}} = a^{\frac{x+2}{3}}$ $\quad Exponentenvergleich$

$\frac{x-3}{2} = \frac{x+2}{3}$ $\quad * 6$

$3(x-3) = 2(x+2) = 3x - 9 = 2x + 4$ $\quad - 2x$

$x - 9 = 4$ $\quad + 9$

$x = 13$

8. Bestimmen Sie x für $\sqrt[x+2]{27} = (\sqrt[3]{3})^{2x+1}$

$27^{\frac{1}{x+2}} = 3^{\frac{2x+1}{3}} wobei 3^3 = 27$

$3^{\frac{3}{x+2}} = 3^{\frac{2x+1}{3}}$ $\quad Exponentenvergleich$

$\frac{3}{x+2} = \frac{2x+1}{3}$ $\quad * 3(x+2)$

$9 = (2x+1)(x+2) = 2x^2 + 4x + x + 2 = 2x^2 + 5x + 2$ $\quad - 9$

$2x^2 + 5x - 7 = 0$ $\quad abc\ Formel$

$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-5 \pm \sqrt{25 - 4*2*(-7)}}{4} = \frac{-5 \pm \sqrt{25+56}}{4} = \frac{-5 \pm \sqrt{81}}{4} = \frac{-5 \pm 9}{4}$

$x_1 = \frac{-5+9}{4} = \frac{4}{4} = 1$ $\qquad$ $x_1 = \frac{-5-9}{4} = \frac{-14}{4} = -3.5$