

Verhalten von Exponential- und Logarithmusfunktion – Lösung

| | Definitionsmenge | Grenzwerte | Nullstellen | Asymptoten |
|-----|------------------------------------|---|--|-------------------------------|
| 1. | $D = \mathbb{R}$ | $\lim_{x \rightarrow -\infty} f(x) = 0^+, \lim_{x \rightarrow \infty} f(x) = 0^+$ | $x_{1,2} = 0$ (BP) | $y = 0$ |
| 2. | $D = \mathbb{R}^+$ | $\lim_{x \rightarrow 0^+} f(x) = -\infty, \lim_{x \rightarrow \infty} f(x) = 0^+$ | $x = 0,25$ | $x = 0$ $y = 0$ |
| 3. | $D = \mathbb{R}$ | $\lim_{x \rightarrow -\infty} f(x) = -\infty, \lim_{x \rightarrow \infty} f(x) = 0^-$ | $x_1 = -1$ $x_2 = 1$ | Keine |
| 4. | $D = \mathbb{R}$ | $\lim_{x \rightarrow -\infty} f(x) = \infty, \lim_{x \rightarrow \infty} f(x) = \infty$ | $x_{1,2} = 0$ (BP) | Keine |
| 5. | $D = \mathbb{R} \setminus [-1; 1]$ | $\lim_{x \rightarrow -\infty} f(x) = \infty, \lim_{x \rightarrow \infty} f(x) = \infty$ $\lim_{x \rightarrow -1^-} f(x) = -\infty, \lim_{x \rightarrow +1^+} f(x) = -\infty$ | $x_1 = -\sqrt{2}$ $x_2 = +\sqrt{2}$ | $x = -1$ $x = 1$ |
| 6. | $D = \mathbb{R} \setminus \{0\}$ | $\lim_{x \rightarrow -\infty} f(x) = \infty, \lim_{x \rightarrow \infty} f(x) = \infty$ $\lim_{x \rightarrow 0^-} f(x) = -\infty, \lim_{x \rightarrow 0^+} f(x) = -\infty$ | $x_1 = -1$ $x_2 = 1$ | $x = 0$ |
| 7. | $D = \mathbb{R}^+$ | $\lim_{x \rightarrow 0^+} f(x) = +\infty, \lim_{x \rightarrow \infty} f(x) = +\infty$ | $x_{1,2} = 1$ (BP) | $x = 0$ |
| 8. | $D = \mathbb{R}$ | $\lim_{x \rightarrow -\infty} f(x) = 3, \lim_{x \rightarrow \infty} f(x) = -\infty$ | $x = \ln 3$ | $y = 3$ |
| 9. | $D = \mathbb{R}^+$ | $\lim_{x \rightarrow 0^+} f(x) = 0, \lim_{x \rightarrow \infty} f(x) = +\infty$ | Keine | Keine |
| 10. | $D = \mathbb{R} \setminus \{0\}$ | $\lim_{x \rightarrow -\infty} f(x) = 2, \lim_{x \rightarrow \infty} f(x) = 0^-$ $\lim_{x \rightarrow 0^-} f(x) = +\infty, \lim_{x \rightarrow 0^+} f(x) = -\infty$ | Keine | $x = 0$ $y = 0$ $y = 2$ |
| 11. | $D = \mathbb{R}$ | $\lim_{x \rightarrow -\infty} f(x) = -\infty, \lim_{x \rightarrow \infty} f(x) = 1$ | $x = -\frac{\ln 0,5}{2}$ | $y = 1$ |
| 12. | $D = \mathbb{R}$ | $\lim_{x \rightarrow -\infty} f(x) = 1, \lim_{x \rightarrow \infty} f(x) = -1$ | $x = 0$ | $y = -1$ $y = 1$ |
| 13. | $D =]-1; 1[$ | $\lim_{x \rightarrow -1^+} f(x) = -\infty, \lim_{x \rightarrow +1^-} f(x) = +\infty$ | $x = 0$ | $x = 1$ $x = -1$ |
| 14. | $D = \mathbb{R}$ | $\lim_{x \rightarrow -\infty} f(x) = -1, \lim_{x \rightarrow \infty} f(x) = 1$ | $x = 0$ | $y = -1$ $y = 1$ |

