$$\lim_{n\to\infty}\left(1+\tfrac{1}{n}\right)^n = e \qquad \text{Definition von } e$$

$$\lim_{n\to\infty}\left(1+\tfrac{1}{n}\right)^n = \lim_{n\to\infty}\left(e^1\right)$$

$$\lim_{n\to\infty}\left(1+\tfrac{1}{n}\right)^n = \lim_{n\to\infty}\left(e^{\frac{1}{n}}\right)^n \qquad |\sqrt[n]{}$$

$$\lim_{n\to\infty}\left(1+\tfrac{1}{n}\right) = \lim_{n\to\infty}\left(e^{\frac{1}{n}}\right) \qquad |-1$$

$$\lim_{n\to\infty}\left(\tfrac{1}{n}\right) = \lim_{n\to\infty}\left(e^{\frac{1}{n}}-1\right) \qquad |\cdot n \neq 0$$

$$\lim_{n\to\infty}(1) = \lim_{n\to\infty}\left(n\cdot\left(e^{\frac{1}{n}}-1\right)\right)$$

$$1 = \lim_{n\to\infty}\left(\frac{e^{\frac{1}{n}}-1}{\frac{1}{n}}\right) \qquad \lim_{n\to\infty}\left(\tfrac{1}{n}\right) = 0 = \lim_{h\to 0}(h)$$

$$1 = \lim_{h\to 0}\left(\frac{e^h-1}{h}\right) \qquad |\cdot e^x$$

$$e^x = \lim_{h\to 0}\left(e^x\cdot\frac{e^h-1}{h}\right)$$

$$e^x = \underbrace{\lim_{h\to 0}\left(\frac{e^{x+h}-e^x}{h}\right)}_{=[e^x]'}$$

© *Thorsten Glaser, Gymnasium Trittau*