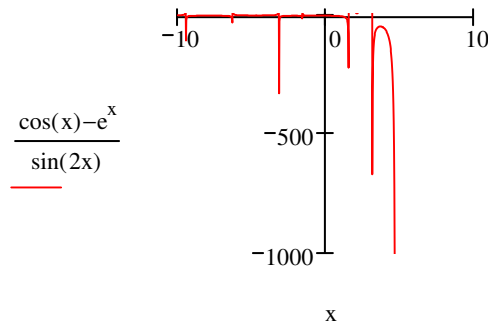


Prüfungsaufgaben

P10. Berechnen Sie die folgenden Grenzwerte:

(a)

$$f(x) := \frac{\cos(x) - e^x}{\sin(2x)} \quad \lim_{x \rightarrow 0} f(x) \rightarrow \frac{-1}{2}$$



$$z'(x) := -\sin(x) - e^x \quad n'(x) := 2 \cdot \cos(2x)$$

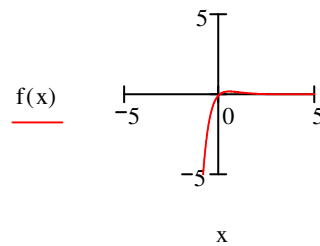
Regel von l'Hopital:

$$\lim_{x \rightarrow 0} \frac{z'(x)}{n'(x)} \rightarrow \frac{-1}{2}$$

(b) $f(x) := x \cdot e^{-2x} \quad \lim_{x \rightarrow \infty} f(x) \rightarrow 0$

$$x = \frac{1}{z}$$

$$\lim_{z \rightarrow 0^+} \frac{1}{z} \cdot e^{-\frac{1}{z}} \rightarrow 0$$



(c) $\lim_{n \rightarrow \infty} \frac{n-2}{n} \rightarrow 1 \quad n := -10, -9, \dots, 10$

$$\lim_{n \rightarrow \infty} \frac{1 - \frac{2}{n}}{1} \rightarrow 1$$

