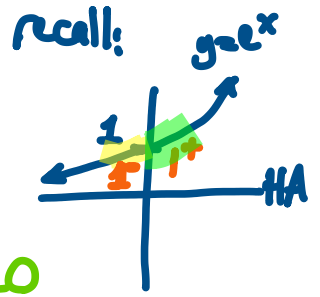


2.6 Pearson HW - Q9

$$f(x) = \frac{4e^x}{1-e^{5x}}, \quad \lim_{x \rightarrow 0^-} f(x) = ?, \quad \lim_{x \rightarrow 0^+} f(x) = ?$$



f is cont. on where $1 - e^{5x} \neq 0 \Rightarrow 1 = e^{5x} \Rightarrow x = 0$
 f is NOT cont. at $x = 0$ (div. by zero!)

f is cont. on $(-\infty, 0), (0, \infty)$

$$\lim_{x \rightarrow 0^-} f(x) = \lim_{x \rightarrow 0^-} \frac{4e^x}{1-e^{5x}} \stackrel{\text{osp}}{=} \frac{4 \cdot e^0}{\underbrace{1-1^-}_{1-0.999\dots \rightarrow 0^+}} = \frac{4}{0^+} = +\infty$$

$$\lim_{x \rightarrow 0^+} f(x) = \lim_{x \rightarrow 0^+} \frac{4e^x}{1-e^{5x}} \stackrel{\text{osp}}{=} \frac{4 \cdot e^0}{\underbrace{1-1^+}_{1-1.00\dots \rightarrow 0^-}} = \frac{4}{0^-} = -\infty$$