

Week 2

01

$$\lim_{x \rightarrow 5} \frac{x^2 - 25}{(x-5)} = \lim_{x \rightarrow 5} (x+5) = 10$$

$$\begin{aligned} \lim_{x \rightarrow 1} \frac{(x^2 + 5x - 6)}{(x^2 - 1)} &= \lim_{x \rightarrow 1} \frac{(x+6)(x-1)}{(x-1)(x+1)} \\ &= \lim_{x \rightarrow 1} \frac{(x+6)}{x+1} \\ &= \frac{7}{2} \end{aligned}$$

$$\lim_{x \rightarrow -1} \frac{(x^2 + 5x + 4)}{(x+1)^2} = \lim_{x \rightarrow -1} \frac{(x+4)(x+1)}{(x+1)^2}$$

$$\lim_{x \rightarrow -1} \frac{(x+4)}{(x+1)} \quad \text{limit does not exist as}$$

$$\lim_{x \rightarrow -1^-} \frac{(x+4)}{(x+1)} = -\infty$$

$$\lim_{x \rightarrow -1^+} \frac{(x+4)}{(x+1)} = \infty$$

$$\text{If } \lim_{x \rightarrow a^+} f(x) \neq \lim_{x \rightarrow a^-} f(x).$$

Limit does not exist.