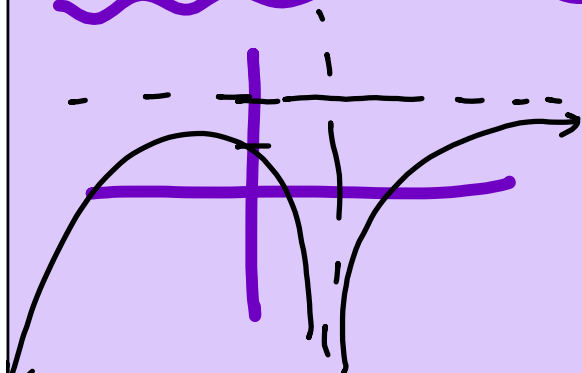


# LIMITS REVIEW



$$\lim_{x \rightarrow -\infty} f(x) = -\infty$$

$$\lim_{x \rightarrow +\infty} f(x) = 2$$



$$\lim_{x \rightarrow -\infty} e^x = 0 \quad \lim_{x \rightarrow \infty} e^x = +\infty$$

$$\lim_{x \rightarrow 0^+} \ln x = -\infty \quad \lim_{x \rightarrow +\infty} \ln x = +\infty$$

$$f(x) = \begin{cases} \frac{x^2-9}{x-3} & \text{if } x < 3 \\ \frac{2}{x-3} & \text{if } x \geq 3 \end{cases}$$

$$\lim_{x \rightarrow 3} f(x) = \boxed{\text{DNE}}$$

$$\lim_{x \rightarrow 3^-} \frac{x^2-9}{x-3} = \frac{0}{0} \quad \lim_{x \rightarrow 3} \frac{\cancel{(x-3)}(x+3)}{\cancel{x-3}} = 6$$

$$\lim_{x \rightarrow 3^+} \frac{2}{x-3} = \frac{2}{0} = \frac{+}{+} = +\infty$$

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$$\lim_{x \rightarrow -\infty} (5 - 3x^2 + 7x^3 - 9x^5)$$

$$\lim_{x \rightarrow -\infty} -9x^5 = -9(-\infty)^5 = +\infty$$

$$\lim_{x \rightarrow 0} \frac{3 \sin 6x \cdot \frac{1}{x}}{\sin 24x \cdot \frac{1}{x}}$$

$$3 \lim_{x \rightarrow 0} \frac{\cancel{6} \cdot \frac{\sin 6x}{\cancel{6} \cdot x}}{\cancel{24} \cdot \frac{\sin 24x}{\cancel{24} \cdot x}}$$

$$\frac{18}{24} \lim_{x \rightarrow 0} \frac{\frac{\sin 6x}{6x}}{\frac{\sin 24x}{24x}}$$

$$\frac{3}{4} \cdot \frac{1}{1} = \left( \frac{3}{4} \right)$$

$$\lim_{x \rightarrow 0} \frac{x+1}{e^x - 1} = \frac{1}{1-1} = \frac{1}{0} \quad \text{DNE}$$

$$\lim_{x \rightarrow 0^+} \frac{x+1}{e^x - 1} = \frac{+}{+} = +\infty$$

$$\lim_{x \rightarrow 0^-} \frac{x+1}{e^x - 1} = \frac{+}{-} = -\infty$$

$$\lim_{x \rightarrow \pi^-} \cot x = -\infty$$

