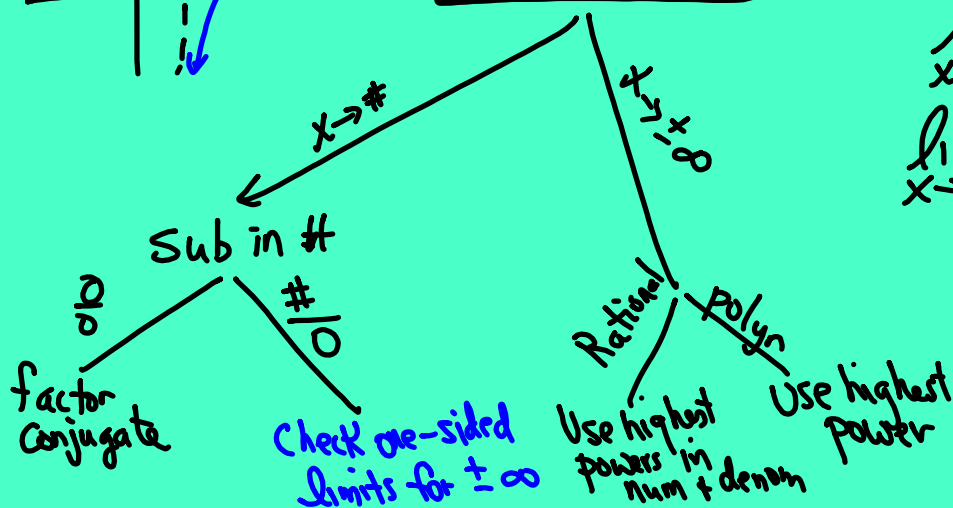


LIMITS



$$\begin{aligned} \lim_{x \rightarrow -\infty} x^3 - 2x^8 + 7 \\ \lim_{x \rightarrow -\infty} -2x^8 \\ -2(-\infty)^8 \\ = -\infty \end{aligned}$$

One-Sided Limits

$$\lim_{x \rightarrow 5^-} \frac{2x+3}{x-1} = \frac{13}{4}$$

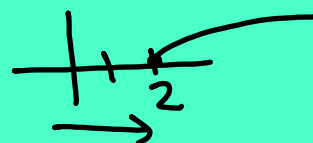
$$\lim_{x \rightarrow 2} \frac{3x}{x-2} = \frac{6}{0} = \text{DNE}$$

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

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

$$\begin{aligned} \lim_{x \rightarrow 3^+} \frac{8x}{(x+3)^2} &= \frac{-24}{0} \\ &= \frac{-}{+} \\ &= \boxed{-\infty} \end{aligned}$$

$$\lim_{x \rightarrow 2^-} \sqrt{x-2} = \text{DNE}$$



$$\lim_{x \rightarrow 4} \frac{8x^2}{(x-4)^4} = \frac{128}{0} = +\infty$$

$$\begin{aligned} \lim_{x \rightarrow 4^-} \frac{8x^2}{(x-4)^4} &= \frac{+}{+} \\ \text{test pts} &= +\infty \end{aligned}$$

$$\lim_{x \rightarrow 4^+} \frac{8x^2}{(x-4)^4} = \frac{+}{+} = +\infty$$

$$f(x) = \begin{cases} \frac{2x+1}{3x-1} & x < -1 \\ \frac{1}{(x-1)^2} & x > -1 \end{cases}$$

$$\lim_{x \rightarrow -1} f(x) = \left(\frac{1}{4} \right)$$

$$\lim_{x \rightarrow -1^-} \frac{2x+1}{3x-1} = \frac{+1}{+4}$$

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

$$\lim_{x \rightarrow -1^-} \frac{2x+1}{x+1} = \frac{-1}{0} = \frac{-}{-} = +\infty$$

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

LIMITS to $\pm \infty$

$$\lim_{x \rightarrow \infty} \frac{\frac{1}{x^2} x^2}{\frac{1}{x^2} 7x^2 + 3} = \frac{\infty}{\infty}$$

$$\lim_{x \rightarrow \infty} \frac{1}{7 + \frac{3}{x^2}} = \frac{1}{7 + \frac{3}{\infty^2}} = \frac{1}{7}$$

$$\lim_{x \rightarrow -\infty} \frac{4x^3 - 3x^2 + 1}{5x^4 + 2x^2 - 9}$$

$$\lim_{x \rightarrow -\infty} \frac{4x^3}{5x^4}$$

$$\lim_{x \rightarrow \infty} \frac{4}{5x} = \frac{4}{\infty} = 0$$

$$\lim_{y \rightarrow -\infty} \frac{5y^3 + 4}{3y + 7}$$

$$\lim_{y \rightarrow -\infty} \frac{5y^3}{3y}$$

$$\lim_{y \rightarrow -\infty} \frac{5}{3} y^2 = \frac{5}{3} (-\infty)^2 = +\infty$$

$$\lim_{x \rightarrow -\infty} \frac{\sqrt{x^2 + 13}}{6x + 5}$$

$$\lim_{x \rightarrow -\infty} \frac{\sqrt[3]{x^2} \leftarrow}{6x}$$

$$\lim_{x \rightarrow -\infty} \frac{\sqrt[3]{|x|} \leftarrow}{6x}$$

$$\lim_{x \rightarrow -\infty} \frac{-x}{6x} = \left(-\frac{1}{6} \right)$$

even index - even power inside - odd power outside

$$\lim_{x \rightarrow \infty} \frac{|x|}{6x}$$

$$\lim_{x \rightarrow \infty} \frac{x}{6x} = \frac{1}{6}$$

$$\sqrt[2]{y^6 z^{16}}$$

$$|y^3| z^8$$