

MORE LIMITS AS $x \rightarrow \pm\infty$

③ RADICALS

$$A. \lim_{x \rightarrow \infty} \sqrt[5]{\frac{x^2}{32x^2+1}} = \sqrt[5]{\frac{1}{32}} = \frac{1}{2}$$

$$\lim_{x \rightarrow \infty} \sqrt[5]{\frac{x}{32x^2+1}} = 0$$

$\infty - \infty$ CONJUGATE

$$C. \lim_{x \rightarrow \infty} \frac{\sqrt{x^2+1} - x}{1} \cdot \frac{\sqrt{x^2+1} + x}{\sqrt{x^2+1} + x}$$

$$= \frac{\cancel{x^2+1} - \cancel{x^2}}{\sqrt{x^2+1} + x} \rightarrow \boxed{0}$$

DENOMINATOR GETS REARANGED; NUM = + |

B. $\lim_{x \rightarrow \infty} \frac{\sqrt{x^2+x}}{2x-x} = \frac{|x|}{2x} = \frac{x}{2x} = \frac{1}{2}$

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

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

$\infty - \infty$

$$\lim_{x \rightarrow \infty} \frac{\sqrt{x^2-3x} - x}{1} \cdot \frac{\sqrt{x^2-3x} + x}{\sqrt{x^2-3x} + x}$$

$$= \frac{\cancel{x^2-3x} - \cancel{x^2}}{\sqrt{x^2-3x} + x} \rightarrow \frac{-3x}{2x} \rightarrow \boxed{-\frac{3}{2}}$$

IGNORE