

Evaluate the following limits:

$$\lim_{x \rightarrow 3} x^2 + 4 = 3^2 + 4 = 13$$

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

$$\lim_{x \rightarrow -8} x + 4 =$$

$$\lim_{x \rightarrow -2} x^2 - 10 =$$

$$\lim_{x \rightarrow a} 3x + 10 =$$

$$\lim_{r \rightarrow 3} 2r + 9 =$$

$$\lim_{p \rightarrow 4} 23 - p =$$

$$\lim_{t \rightarrow 3.5} 3t + 2 =$$

$$\lim_{t \rightarrow 2} t^2 - 2t + 4 =$$

$$\lim_{x \rightarrow 0} x^3 - 10x^2 + 3x + \pi =$$

$$\lim_{x \rightarrow \pi} \sin(x) =$$

$$\lim_{t \rightarrow \frac{\pi}{2}} \cos(t) =$$

$$\lim_{r \rightarrow 0} \tan(r) =$$

$$\lim_{t \rightarrow 0} 4t^2 + \cos(t) + \sin^2(\pi t) - 36 \cdot t^{1/2} + 4\sqrt[4]{t+1} =$$

$$\lim_{t \rightarrow 2} \frac{(t^2+1)(t-4)}{(t+3)(t+8)} =$$

Evaluate the following limits. You may need to use algebra to rewrite the function before taking the limit. Pay close attention to your notation and keep the limit notation until you finally evaluate the limit.

$$\lim_{x \rightarrow 4} \frac{(x+2)(x-4)}{(x^2-16)} \quad \text{try it: } \frac{(4+2)(4-4)}{(4^2-16)} \rightarrow 0 \Rightarrow \text{"Plug + chug" is NOT working.}$$

Attempt # 2:

$$\lim_{x \rightarrow 4} \frac{(x+2)(x-4)}{(x^2-16)} = \lim_{x \rightarrow 4} \frac{(x+2)(x-4)}{(x+4)(x-4)} = \lim_{x \rightarrow 4} \frac{x+2}{x+4} = \frac{4+2}{4+4} = \frac{6}{8} = \frac{3}{4}$$

factor (x^2-16)
cancel $(x-4)$ terms
evaluate (no more $\lim_{x \rightarrow 4}$)

$$\lim_{x \rightarrow 2} \frac{(x-2)(x+3)}{(x+10)(x-2)} =$$

$$\lim_{x \rightarrow 3} \frac{(x-2)(x-3)}{(x-3)(x+4)} =$$

$$\lim_{t \rightarrow -2} \frac{(t+2)(t+3)}{(t+4)(t+2)} =$$

$$\lim_{t \rightarrow 3} \frac{(t-3)(t+4)}{(t^2-9)} =$$

$$\lim_{t \rightarrow -2} \frac{(t+2)(t-3)}{(t^2-4)} =$$

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

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

$$\lim_{t \rightarrow 2} \frac{(t^2-4)}{t^2+3t-10} =$$

$$\lim_{t \rightarrow 3} \frac{t^2 - 5t + 6}{t^2 + t - 12} =$$

$$\lim_{x \rightarrow \frac{1}{2}} \frac{2x^2 - 13x - 24}{2x^2 + 11x + 12} =$$

$$\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2} = \lim_{x \rightarrow 4} \frac{(x-4)(\sqrt{x}+2)}{(\sqrt{x}-2)(\sqrt{x}+2)} = \lim_{x \rightarrow 4} \frac{(x-4)(\sqrt{x}+2)}{x-4} = \lim_{x \rightarrow 4} \sqrt{x}+2 = \boxed{4}$$

multiply by conjugate *hint: don't expand numerator* *cancel x-4*

$$\lim_{x \rightarrow 16} \frac{\sqrt{x}-4}{x-16} =$$

$$\lim_{x \rightarrow 9} \frac{x^2 - 9x}{\sqrt{x} - 3} =$$

$$\lim_{x \rightarrow 0} \frac{\sqrt{x^2+25} - 5}{x^2} =$$

$$\lim_{t \rightarrow 0} \frac{t^2}{\sqrt{t^2+9} - 3}$$