

PM-Calculus

1.5 – Finding Limits Algebraically

To evaluate $\lim_{x \rightarrow c} f(x)$ algebraically, we use the **SUBSTITUTION** method, i.e. we calculate the value of $f(c)$.

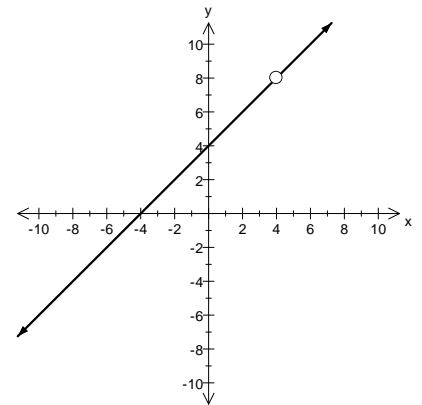
A. If $f(c) = \text{Real Number} \dots$

1. Evaluate: $\lim_{x \rightarrow -2} (x + 4)$

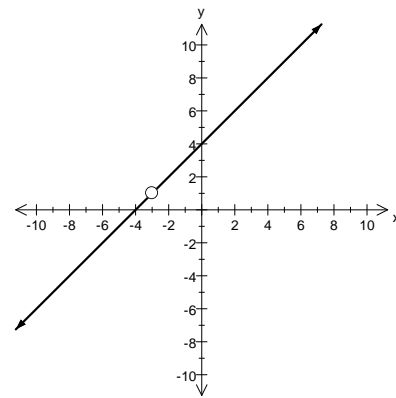
2. Evaluate: $\lim_{x \rightarrow 3} \frac{x^2 - 16}{x - 4}$

B. If $f(c) = \frac{0}{0}$ or $\frac{\infty}{\infty}$ or $\infty - \infty \dots$

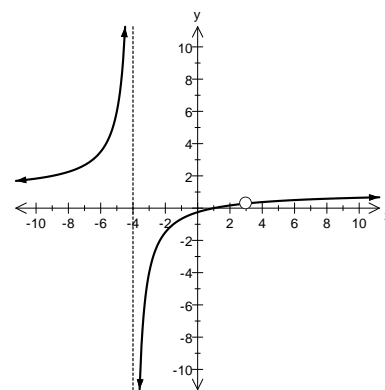
1. Evaluate: $\lim_{x \rightarrow 4} \frac{x^2 - 16}{x - 4}$



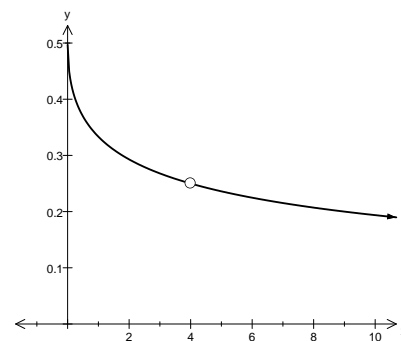
2. Evaluate: $\lim_{x \rightarrow -3} \frac{x^2 + 7x + 12}{x + 3}$



3. Evaluate: $\lim_{x \rightarrow 3} \frac{x^2 - 4x + 3}{x^2 + x - 12}$



4. Evaluate: $\lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x - 4}$

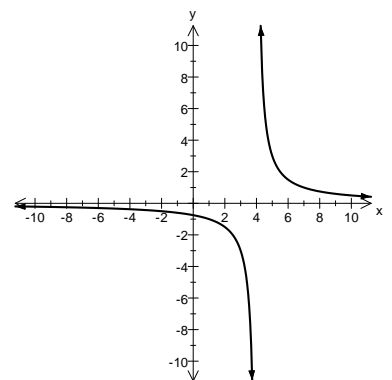


5. Evaluate: $\lim_{h \rightarrow 5} \frac{h-5}{\sqrt{h+4}-3}$

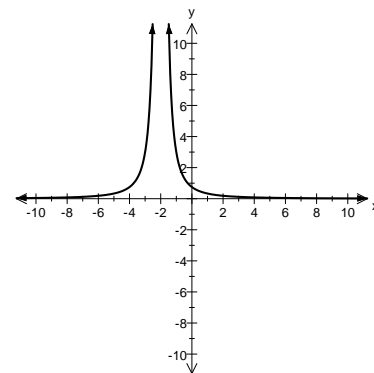
6. Evaluate: $\lim_{b \rightarrow 0} \frac{\frac{1}{2+b} - \frac{1}{2}}{b}$

C. If $f(c) = \frac{\text{Real Number}}{0}$...

1. Evaluate: $\lim_{x \rightarrow 4} \frac{3}{x-4}$



2. Evaluate: $\lim_{x \rightarrow -2} \frac{3}{(x+2)^2}$



What about... $f(x) = \frac{x^2 + 2x - 15}{(x-3)(x-4)}$? Can you predict if the graph of $f(x)$ has a *hole* or a *VA* or both and their locations?

Given, $f(x) = \frac{x^2 - 6x - 7}{(x-7)(x+2)}$ determine the locations of any *holes* and/or *VA*.