

Quiz #4

Directions: Carefully read each question below and answer to the best of your ability in the space provided. You **MUST** show your work to receive full credit!

1. (6 points) Evaluate the following limits:

(a) $\lim_{x \rightarrow 2} \frac{x - 3}{x^2 - 7x + 12}$

Solution:

$$\lim_{x \rightarrow 2} \frac{x - 3}{x^2 - 7x + 12} = \frac{(2) - 3}{(2)^2 - 7(2) + 12} = \boxed{-\frac{1}{2}}$$

(b) $\lim_{x \rightarrow 3} \frac{x - 3}{x^2 - 7x + 12}$

Solution:

$$\lim_{x \rightarrow 3} \frac{x - 3}{x^2 - 7x + 12} = \lim_{x \rightarrow 3} \frac{x - 3}{(x - 3)(x - 4)} = \lim_{x \rightarrow 3} \frac{1}{x - 4} = \boxed{-1}$$

2. (4 points) For what values of A is g continuous?

$$g(x) = \begin{cases} x^2 & x \leq 2 \\ A - 5x & x > 2 \end{cases}$$

Solution: Note that the function g is clearly continuous everywhere except point $x = 2$. For the function $g(x)$ to be continuous at $x = 2$, $\lim_{x \rightarrow 2} g(x)$ has to exist and $\lim_{x \rightarrow 2} g(x) = g(2)$. But we know that $\lim_{x \rightarrow 2} g(x)$ would exist if and only if $\lim_{x \rightarrow 2^-} g(x) = \lim_{x \rightarrow 2^+} g(x)$. Clearly, $g(2) = (2)^2 = 4$. Now, we have

$$\begin{aligned} \lim_{x \rightarrow 2^-} g(x) &= \lim_{x \rightarrow 2^-} (x^2) = 4 \quad \text{and} \\ \lim_{x \rightarrow 2^+} g(x) &= \lim_{x \rightarrow 2^+} (A - 5x) = A - 10. \end{aligned}$$

So, we would have to set $4 = A - 10$ and solve it for A , clearly, $\boxed{A = 14}$.

Name: _____

Section (circle one): 003 004

Question:	1	2	Total
Points:	6	4	10
Score:			