

Quiz 3

Name:

1. Find the following limits:

$$a. \lim_{x \rightarrow 2} \frac{x^2 - 5x + 6}{x^2 - 8x + 12} = \frac{1}{4}$$

$$b. \lim_{x \rightarrow 6^+} \frac{x^2 - 5x + 6}{x^2 - 8x + 12} = \infty$$

2. Find the following limits:

$$a. \lim_{x \rightarrow \infty} \frac{x^5 - 5x^3 + 6}{x^2 - 8x + 12} = \infty$$

$$b. \lim_{x \rightarrow -\infty} \frac{3x^3 + 9x + 6}{x^4 - 2x} = \circ$$

3. Where are the following functions continuous:

$$a. f(x) = \frac{x^2 - 3x - 4}{x - 4} \quad \mathbb{R} \setminus \{4\}$$

$$b. f(x) = e^{8x-9} - 3 \quad \mathbb{R}$$

note:

$$4. \text{ Where is } f(x) = \begin{cases} \frac{x^2 - 6x - 7}{x + 1} & x > 2 \\ 2x + 1 & x \leq 2 \end{cases} \text{ continuous?}$$

$$\mathbb{R} \setminus \{2\}$$

at $x = -1$ $f(x)$ is continuous because

$$f(-1) = 2(-1) + 1 = -1 \quad (\text{since } 1 \leq 2)$$

Quiz 4

Name:

You must use the definitions to answer the following questions. The final answer must be written in pen otherwise you will not get credit for it.

If $f(x) = -4x^2 + 3x + 2$, find

1. the average rate of change between $x = 2$ and $x = 5$.

$$\frac{f(5) - f(2)}{5 - 2} = \boxed{-25}$$

2. the secant line between $x = 2$ and $x = 5$.

$$(2, f(2)) = (2, -8)$$

$$\boxed{y + 8 = -25(x - 2)} \quad \text{or} \quad \boxed{y = -25x + 42}$$

3. the instantaneous rate of change at $x = 2$.

$$f'(2) = \underline{\underline{-13}}$$

4. the tangent line at $x = 2$. $(2, -8)$

$$\boxed{y + 8 = -13(x - 2)} \quad \text{or} \quad \boxed{y = -13x + 18}$$