

NAME: _____

MATH 132 - Michigan State University
September 14th, 2018.

Quiz 2

Clear your desk of everything except pens, pencils and erasers. **Show all your work.**

If you have a question raise your hand and I will come to you.

1. [4 points] Consider the function:

$$f(x) = \begin{cases} x^2 - 5x + 4, & \text{if } x < 0 \\ 10, & \text{if } x = 0 \\ \frac{4x}{x^2+x}, & \text{if } x > 0. \end{cases}$$

a). [3 pts.] Find the limits:

$$\lim_{x \rightarrow 0^-} f(x) =$$

$$\lim_{x \rightarrow 0^+} f(x) =$$

b). [1 pt.] Is the function f continuous at 0? If not, state the type of discontinuity.

2. [6 points] Consider the function

$$f(x) = 3\sqrt{x} - 5.$$

a). [3 pts.] Simplify as much as possible the quotient

$$\frac{f(4+h) - f(4)}{h}$$

b). [2 pts.] Use the results in part a). to find $f'(4)$.

c). [1 pt.] Write the equation of the line tangent to the curve $y = f(x)$ at the point $(4, f(4))$.

Bonus: [1 pt.] Find

$$\lim_{x \rightarrow \frac{\pi}{4}} \cos \left(5x - \sin(4x) \right)$$