

Math 131 - Quiz 3
September 7, 2022

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. This quiz is due September 12.

1. (2 points) Find the number k so that f is continuous at $x = 0$.

$$f(x) = \begin{cases} \frac{\tan 3x}{5x}, & x < 0 \\ x^2 + x + k, & x \geq 0 \end{cases}$$

2. (3 points) Find and classify the discontinuities of $r(x) = \frac{x^2 + 6x - 7}{x^2 - 1}$.

Turn over.

3. (2 points) Find an interval of length one that contains a solution of the equation $x^5 - 3x^3 + 7x - 13 = 0$. Use the Intermediate Value Theorem to explain your answer.

4. (3 points) Argue that the following function is continuous everywhere.

$$g(x) = \begin{cases} 5x + \cos(\pi x) + e^{x-1}, & x \leq 1 \\ 3x^2 - 7x + 9, & x > 1 \end{cases}$$