

Show all work clearly and in order, and circle your final answers.
Justify your answers algebraically whenever possible.

1. (2 points) True or false?

(a) Given any function f whose domain is $(0, 1)$, I know that there is a root of f on the interval $(0, 1)$ when $f(0) = -3$ and $f(1) = 4$.

(b) The intermediate value theorem tells me that when g is a continuous function and $x \leq g(x) \leq x^2$, that $\lim_{x \rightarrow 0} g(x) = 0$.

2. (2 points) Compute $\lim_{x \rightarrow 5} \frac{x^2 - 25}{x^2 - 3x - 10}$.

3. (2 points) Compute the slope of the tangent line of the graph $y = 3x^2$ at the point $x = 4$.