

Quiz 4

1. (5 points). Compute the limit $\lim_{x \rightarrow 0} (3e^x + 2(x + 3))$. You may assume the exponential function is continuous everywhere.

2. (5 points). Find the largest δ such that, whenever x satisfies $0 < |x - 2| < \delta$, $|\frac{1}{x^3} - \frac{1}{2^3}| < 1$.

3. (5 points). Let m and b be real numbers such that $m \neq 0$. Prove that $\lim_{x \rightarrow a} (mx + b)$ exists for all a , using the definition of the limit.

Extra credit. (2 points). Prove from the definition of the limit that $f(x) = \sqrt{x}$ is continuous at all $x > 0$.