

MATH 150A-QUIZ 4, WINTER 2019

Name: _____

1. Let $f : I \rightarrow \mathbb{R}$ be a function defined on an interval I . Let $\xi \in I$ be an interior point.
 - (1) State the definition that $\lim_{x \rightarrow \xi} f(x) = A$ for some $A \in \mathbb{R}$.
 - (2) State the definition that $f(x)$ is continuous at ξ .
 - (3) Point out the difference of the two definitions you stated above. Then sketch graphs of two functions to illustrate the possible differences.

2. Show by definition that $f(x) = \cos(x)$ is continuous on $\mathbb{R}$. *Here you may use the following formula/fact: (1). $\cos(a) - \cos(b) = 2 \sin(\frac{a+b}{2}) \sin(\frac{a-b}{2})$, $\forall a, b \in \mathbb{R}$; (2) $|\sin(x)| \leq |x|$, $\forall x \in \mathbb{R}$.*