

MATH 150A-QUIZ 6, WINTER 2019

Name: _____

1. (5 pts) Let $f, g : I \rightarrow \mathbb{R}$ be continuous at ξ . Show that the product fg is continuous at ξ .

Here you may either prove it by definition or prove it via the following theorem that we proved in class (Theorem 2.1): $h : I \rightarrow \mathbb{R}$ is continuous at $\xi \in I$ if and only if the following holds true: for any sequence $\{x_n\}$ in I such that $\lim_{n \rightarrow \infty} x_n = \xi$, it holds that $\lim_{n \rightarrow \infty} h(x_n) = h(\xi)$.

2. Consider a function $f(x) = \cos \sqrt{x^2 + (\frac{\pi}{2})^2}$.

(1) (3 pts) Show that f is continuous on \mathbb{R} .

(2) (2 pts) Use the fact from part (1) to compute the limit $\lim_{n \rightarrow \infty} \cos \sqrt{\frac{1}{n^2} + (\frac{\pi}{2})^2}$.