

Math330 HW8 (Fall 2020)

Professor Youngjoon Hong

Due Date: Nov. 11 (11:59 am)

Problem 1 *Let f and g two functions continuous at x_0 . Use the $\epsilon - \delta$ definition to prove $f + g$ is continuous at x_0 .*

Problem 2 *Prove that any rational function is continuous on its domain of definition.*

Problem 3 *Use the $\epsilon - \delta$ definition to prove that*

$$f(x) = \frac{x + 3}{x - 5}$$

is continuous at $x = 2$.

Problem 4 *Use the $\epsilon - \delta$ definition to prove that*

$$f(x) = |x|$$

is continuous over \mathbb{R} .

Problem 5 *Use the $\epsilon - \delta$ definition to prove that*

$$f(x) = \frac{1}{1 + x^2}.$$

is uniformly continuous over \mathbb{R} .