Morales

MA538

Fall 2021

HOMEWORK 1

1. Let $f : X \to Y$ be a mapping. Show

$$f(f^{-1}(B)) \subseteq B, \text{ for every } B \subseteq Y.$$

2. Let $f : X \to Y$. Show :

$$f \text{ is injective if and only if } f(A \cap B) = f(A) \cap f(B) \text{ for all } A, B \subset X.$$

3. Let $X = \{f : [a, b] \to \mathbb{R} \mid f \text{ is continuous}\}$. Define

$$d(f, g) = sup\{|f(t) - g(t)| : t \in [a, b]\}.$$

Show that d is a metric for X.

DUE : AUGUST 31, 2021

Notice: *Make sure you justify every single claim that you make.*