Math 5863
TF Problem Set # 2
Class group assignment due for discussion on Friday January 25

Instructions: Determine whether each statement is true or false and be prepared to provide a brief proof or counterexample supporting your conclusion. (Please discuss with all classmates beforehand!)

PROBLEM 1.   The topology on $\mathbb{R}$ with basis $\mathcal{B} = \{(a, \infty) \mid a \in \mathbb{R}\}$ is completely metrizable.

PROBLEM 2.   The Cantor one-third set in $\mathbb{R}$ is complete.

PROBLEM 3.   The French railway metric on $\mathbb{R}^2$ is complete.

PROBLEM 4.   Total boundedness is a topological property of metric spaces.

PROBLEM 5.   A separable metric space is totally bounded.

PROBLEM 6.   There is a metric on the open interval $X = (0, 1)$ generating the Euclidean topology for which $X^* - X$ is uncountable (where X^* denotes the completion of the metric space X).