**Week 2: Assignment 2**

The due date for submitting this assignment has passed.

As per our records, you have not submitted this assignment.

1) Which of the following sets are always compact in any metric space? 1 point
   - The empty set.
   - Singleton sets.
   - Countable sets.
   - Finite sets.

   No, the answer is incorrect. Score: 0

   Accepted answers:
   - Singleton sets.
   - Finite sets.

2) Which of the following spaces are complete? 1 point
   - The set \( Z \) given the metric inherited from \( \mathbb{R} \).
   - The space \( (E, F) \) where \( E \) and \( F \) are normed vector spaces.
   - The space \( (X, d) \) where \( X \) is a metric space.
   - The space \( (C(X, F), Y) \) where \( X \) and \( Y \) are metric spaces and \( X \) is compact.

   No, the answer is incorrect. Score: 0

   Accepted answers:
   - The set \( Z \) given the metric inherited from \( \mathbb{R} \).
   - The space \( (X, d) \) where \( X \) is a metric space.

3) Let \( X \) and \( Y \) be metric spaces and let \( f : X \rightarrow Y \) be a continuous function. Let \( E \subseteq X \), which of the following properties hold true for \( f \)? 1 point
   - \( f \) is finite.
   - \( f \) is closed.
   - \( f \) is continuous.
   - \( f \) is bounded.

   No, the answer is incorrect. Score: 0

   Accepted answers:
   - \( f \) is finite.

4) Let \( X \) be a complete metric space and let \( F \) be a subset. Mark the true statements. 1 point
   - If \( F \) is closed then \( F \) is complete.

   No, the answer is incorrect. Score: 0

   Accepted answers:
   - If \( F \) is closed then \( F \) is complete.

5) Which of the following are true? 1 point
   - All metric spaces are normed vector spaces.
   - All normed vector spaces are metric spaces.
   - Any metric space can be completed.
   - Any metric space can be viewed as a dense subset of a Banach space.

   No, the answer is incorrect. Score: 0

   Accepted answers:
   - Any metric space can be completed.
   - Any metric space can be viewed as a dense subset of a Banach space.

6) In an arbitrary metric space which of the following are true about compactness? 1 point
   - The Heine-Borel Theorem, that is, a subset is compact if it is closed and bounded.
   - Sequential compactness and compactness are equivalent.
   - A subset is compact if it has the compactness property.
   - A subset that is compact must necessarily have the compactness property.

   No, the answer is incorrect. Score: 0

   Accepted answers:
   - Sequential compactness and compactness are equivalent.

7) Which of the following are true about totally bounded subsets of a metric space? 1 point
   - They are automatically bounded.
   - A bounded set is automatically totally bounded.

   No, the answer is incorrect. Score: 0

   Accepted answers:
   - A bounded set is automatically totally bounded.

8) Which of the following are true about the topology of a metric space? 1 point
   - Compactness.
   - Boundedness.
   - Openness.
   - Compressibility.

   No, the answer is incorrect. Score: 0

   Accepted answers:
   - Openness.