Homework true false questions. In the midterm guessing will be both encouraged and discouraged-you will get $2x$ points for a correct answer and $-x$ points for a wrong one where x is yet to be determined.

1)A bounded complete separable metric space is sequentially compact.

2) The Cantor set is uncoubtable and non-separable.

3)Any path-connected metric space is connected.

4) The continuous image of an open set is open.

5)If A is a closed subset of the metric space (X, d) and B is a closed subset of A (with the inherited metric) then B is closed in X.

6) The complement of a complete subset of a metric space is open.

7)A sequence (x_n) in a metric space (X, d) is Cauchy iff for every open set $U \subseteq X$ there is an $N \in \mathbb{N}$ such that $n, m \geq N \Rightarrow \{x_n, x_m\} \subseteq U$.

8) The set of all *finite* subsets of $\mathbb{R}$ is countable.

9) Any two metric spaces that are homeomorphic are isometric.

10) If U_n are open non-empty subsets of $\mathbb{R}^n$ and $U_{n+1} \subseteq U_n$ then $\bigcap_{n=1}^{\infty} U_n$ is non-empty.

11) No countable metric space is complete.

12) No countable metric space with more than 2 points is connected.

13) If (s_n) is a sequence in $\mathbb{R}$ which is bounded above then $\liminf s_n = \limsup s_n$.

14) If $\limsup |s_n| = \limsup |t_n|$ then $\limsup(s_n + t_n) = 2 \limsup s_n$.

15) Any open subset of $\mathbb{R}^2$ is a union of open balls.