University of Wisconsin-Madison
Department of Economics

Econ 703 Prof. R. Deneckere
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Homework #4

1. Is every point of every open set $E \subset R^2$ a limit point of E? Answer the same question for closed sets in R^2.

2. Let $B \subset R^2$ be as follows: $B = \left\{(x,y) \in R^2 : y = \sin \frac{1}{x}, x > 0\right\} \cup \{(0,0)\}$ Is B closed? open? bounded? compact?

3. Let (X,d) be a metric space. Prove the following statement: $A \subset X$ is closed iff for every sequence $\{x_n\} \subset A$, $x_n \to x$ implies $x \in A$.

4. Let (X,d) be a metric space, and let $A \subset X$. Prove that A is closed if and only if it contains all of its limit points.