May 17, 2005 Homework Answers

1. For each of the sets shown below, determine the following:
   - Identify the rule defining the set, i.e., what is the blank in $A = \{a \mid \_\_\_\_\_\}$.
   - Identify the universal set.
   - Determine if the set is finite or infinite.
   - Calculate the cardinality of the set.
   - If the set is finite, calculate the number of sets in the power set.

   a.) $A = \{y, e, s\}$
   - A = {a | a is a letter from the word "yes"}
   - U = alphabet
   - finite
   - $|A| = 3$
   - $|P(A)| = 2^3 = 8$

   b.) $A = \{1, 3, 5, 7, 9, 11, 13, \ldots\}$
   - A = {a | a is an odd positive integer}
   - U = integers or positive integers
   - infinite
   - $|A| = \infty$
   - $|P(A)| = \infty$

   c.) $A = \{1, 0.5, 0.25, 0.125, 0.0625, \ldots\}$
   - A = {a | a equals $1/2^n$ where n = 0, 1, 2, 3, 4, …}
   - U = real numbers
   - infinite
   - $|A| = \infty$
   - $|P(A)| = \infty$

   d.) $A = \{a, f, n, o, r, t\}$
   - A = {a | a is a letter from the word "tarnoff"}
   - U = alphabet
   - finite
   - $|A| = 6$
   - $|P(A)| = 2^6 = 64$

2. Draw a Venn diagram to show how *A* could be contained in *B* and *C* could be contained in *B*, but *A* and *C* share no common elements.