Math 112 - Quiz 1
January 16, 2019

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (1 point) In one of the exercises in our textbook, the author claims that the set of all mothers is NOT well defined. Give at least one reason why it is not well defined.

   Does mother refer to biological mother, adopted mother, person who raised, etc. ? "Mother" is not clear.

2. (3 points) Let $A = \{10, 20, 30, 40, 50, \dots\}$.

   (a) Is it true that $240 \in A$? Explain your answer.

   Yes, A is the set of positive multiples of 10. 240 is a pos. multiple of 10.

   (b) Is it true that $7172 \in A$? Explain your answer.

   No, 7172 is not a pos. mult. of 10.

   (c) Give a verbal description of the set A.

   See above. A is the set of positive multiples of 10.

3. (2 points) Let $B = \{x | x \in \mathbb{N} \text{ and } -7 \leq x < 5\}$.

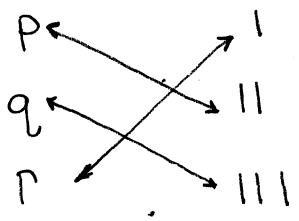
   (a) Write B is roster notation.

   $B = \{1, 2, 3, 4\}$

   (b) Give a verbal description of B.

   B is the set of natural numbers strictly less than 5.

4. (1 point) Use a table or diagram to show a one-to-one correspondence between the sets $\{p, q, r\}$ and $\{1, 11, 111\}$.



5. (1 point) Determine the cardinality of the set $\{\emptyset, \{\emptyset\}\}$.

THERE ARE 2 ELEMENTS: $\emptyset$, $\{\emptyset\}$

6. (1 point) Suppose A and B are sets with $n(A) = 3$ and $n(B) = 4$. Is it possible that $A \cong B$? Explain your answer.

NO, IN ORDER FOR A & B TO BE IN A ONE-TO-ONE CORRESPONDENCE, THEY MUST HAVE THE SAME NUMBER OF ELEMENTS.

7. (1 point) Let $Q = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16\}$. Write Q in set-builder notation.

$Q = \{x \mid x \in \mathbb{N} \text{ AND } x \leq 16\}$