

Math 112 - Quiz 1

August 23, 2017

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary. YOU MUST WORK INDIVIDUALLY.

1. (2 points) Explain why the set of old people is not a well-defined set. What could be done to make the set be well defined?

IT IS NOT CLEAR WHAT IT MEANS TO BE "OLD". THE DESCRIPTION OF THE SET GIVES NO OBJECTIVE CRITERIA FOR TESTING "OLD". TO MAKE THE SET WELL DEFINED, A DEFINITION OF "OLD" SHOULD BE GIVEN.

2. (2 points) Suppose A is the set of all natural numbers greater than 3 and less than or equal to 8. Write A in both roster notation and set-builder notation.

$$\{4, 5, 6, 7, 8\} = \{x \mid x \in \mathbb{N}, 3 < x \leq 8\}$$

3. (2 points) Let X be the set of letters in the word *racecars*. Write X in roster notation and then determine $n(X)$.

$$X = \{r, a, c, e, s\} \quad n(X) = 5$$

4. (4 points) Determine if each sentence is true or false. If false, explain why.

(a) $e \in \{a, b, c, d\}$

FALSE, e IS CLEARLY NOT AN ELEMENT OF THE SET.

(b) $2.5 \in \mathbb{N}$

FALSE, 2.5 IS NOT A NATURAL (COUNTING) NUMBER

(c) $48 \in \{0, 4, 8, 12, 16, 20, \dots\}$

TRUE

(d) $\{2, 4, 6, 8, 10, 12\} \in 8$

FALSE, THIS MAKES NO SENSE.

A SET CANNOT BE AN ELEMENT OF A NUMBER.