

Math 112 - Quiz 1

August 24, 2017

Name key

Score _____

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

1. (4 points) Determine if each sentence is true or false. If false, explain why.

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

True

(b) $-5 \in \mathbb{N}$

False, -5 is an integer, but not a natural number.

(c) $21 \in \{0, 3, 6, 9, 12, \dots\}$

True (21 is a multiple of 3)

(d) $\{m, i, s, p\} \in p$

False, this is nonsense because it is written backwards.

2. (2 points) Give an example of a set that is not well defined. Explain what is wrong with your set's definition.

The set of old people is not well defined because it is not clear what it means for a person to be "old".

3. (2 points) Suppose B is the set of all natural numbers greater than or equal to 7 but strictly less than 13. Write B in both roster notation and set-builder notation.

$$\{7, 8, 9, 10, 11, 12\}$$

$$\{x \mid x \in \mathbb{N}, 7 \leq x < 13\}$$

4. (2 points) Let Z be the set of letters in the word *suburbs*. Write Z in roster notation and then determine $n(Z)$.

$$Z = \{s, u, b, r\}$$

$$n(Z) = 4$$