Algebra 1 Unit 1 quiz 1: Elements and membership, Writing sets: roster, rule and the empty set

Name _____ Date _____ Period _____

8 questions, 20 points

1. Let E be the set of solutions of the equation $x^2 + 7x = -10$. Decide whether each of 5, -2 and -5 is an element of E, and write each answer with $\in$ or $\notin$. (2 points)

2. Write as a roster the set of whole numbers n for which $3n + 2$ is less than 24. How many elements does it have? (2 points)

3. Let $x = -3$, and let $S = \{x - 3,\ 2x,\ x^2,\ 9\}$. Write S with each element listed once, and say how many elements it has. (2 points)

4. Write each set as a roster, using an ellipsis where one is needed. Then give its number of elements, or say that it is infinite. (3 points)

(a) The multiples of 10 strictly between -50 and 50.

(b) The multiples of 4 that are less than -10.

(c) The two-digit whole numbers whose digits add up to 3.

(d) The whole numbers n for which $n + 7$ is less than 7.

5. Let $A = \{2, \{2\}\}$, $B = \{\{2\}, 2, 2\}$, $C = \{2, \{2, 2\}\}$ and $D = \{\{2\}, \{2\}\}$. (3 points)

(a) How many elements does each set have?

(b) Which of the four sets are equal to each other? Explain using the rule for equal sets.

Free sample from math.wiki for classroom use. Do not post. math.wiki

6. Write the solution set of each equation. Use a roster or $\varnothing$ where you can; otherwise describe the set in words. (3 points)

(a) $4(x-7)=4x-4$

(b) $3(x+7)=3x+21$

(c) $9(x+7)=63$

7. Let $S=\{k+13,\ k^2,\ 2k+9\}$, where k is a real number. (3 points)

(a) Find every value of k for which $17 \in S$.

(b) One of those values is a whole number. For that value of k, write S with each element listed once and say how many elements it has.

8. Grace describes the set $\{1,3,5,7,9\}$ as "the odd whole numbers less than 10". Hannah says the word "whole" should be "positive", because otherwise the rule lets in 0. Is Hannah right that Grace's rule lets in a number that is not in the set? Explain by testing Grace's rule both ways. (2 points)

Free sample from math.wiki for classroom use. Do not post. math.wiki