Math 200 - Quiz 4

February 7, 2012

Name **key**

Score _____

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

1. (1.5 points) A sequence is defined recursively as follows:

$$M_1 = 2, \qquad M_2 = 3, \qquad M_n = 5M_{n-1} - 2M_{n-2}, \quad \text{for } n = 3, 4, 5, \ldots.$$

Find M_4.

$M_3 = 5M_2 - 2M_1 = 5(3) - 2(2) = 11$

$M_4 = 5M_3 - 2M_2 = 5(11) - 2(3) = 55 - 6 = \boxed{49}$

2. (1 point) Is the set of all small cars a well-defined set? Explain.

No, IT IS NOT. CLEAR WHAT IS MEANT BY A SMALL CAR. How SMALL IS A SMALL CAR?

3. (1 point) The set B is defined below using set-builder notation. Rewrite B using roster notation.

$$\{x \mid x \in \mathbb{N} \text{ and } 17 \le x \le 24\}$$

$B = \{17, 18, 19, 20, 21, 22, 23, 24\}$

4. (1.5 points) Let $A = \{1, 2, 3, 4\}$, $B = \{1, 2, 6, 7\}$ and $C = \{1, 2\}$. Tell whether each statement is true or false. For each false statement, briefly explain why it is false.

(a) $C \subseteq B$ TRUE, EVERY ELEMENT OF C IS ALSO AN ELEMENT OF B.

(b) $C \in A$ FALSE. THE SET C IS NOT AN ELEMENT OF A. THE ELEMENTS OF A ARE NUMBERS, NOT SETS.

(c) $C \sim A$ FALSE. C AND A ARE NOT IN 1-1 CORRESPONDENCE BECAUSE $n(A) = 4$ AND $n(C) = 2$.