Math 0099
University of North Georgia
Spring 2015
Quiz #3

Name: Key Date: January

Consider the following two sets:

$\mathcal{A} = \{x \in \mathbb{N} | 3 \leq x < 7\} = \{3, 4, 5, 6\} = [3, 7)$

$\mathcal{B} = \{x \in \mathbb{Z} | -3 < x \leq 4\} = \{-2, -1, 0, 1, 2, 3, 4\} = (-3, 4]$

1. Express $\mathcal{A} \cup \mathcal{B}$ using ***Set-Builder*** and ***Interval*** notations.

$\{x \in \mathbb{Z} | -3 < x < 7\}$

$(-3, 7)$

2. Express $\mathcal{A} \cap \mathcal{B}$ using ***Set-Builder*** and ***Interval*** notations.

$\{x \in \mathbb{N} | 3 \leq x \leq 4\}$

$[3, 4]$

3. Consider the relation $\mathcal{G} = \{(3,6), (-5,-10), (6,12), (4,8)\}$.
   a. State the domain of $\mathcal{G}$
   b. State the range of $\mathcal{G}$
   c. Determine if the relation $\mathcal{G}$ is also a function. If so, complete the following: $\mathcal{G} | x \rightarrow ?$

a.) Domain: $\{3, -5, 6, 4\}$

b.) Range: $\{6, -10, 12, 8\}$

c.) Yes $\mathcal{G}$ is a function because there are no repeated elements of the domain.

$\mathcal{G} | x \rightarrow 2x$

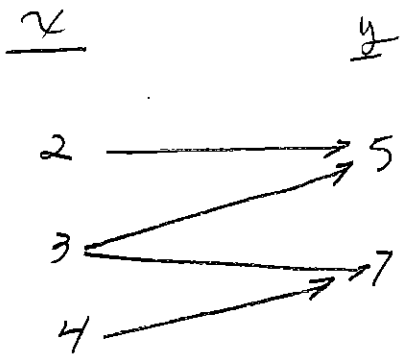
4. Given the function g is define by the rule $g\,|x \rightarrow 3x + 4$ find the following:
$h\,|3a - 5 \rightarrow ?$

$h \mid 3a - 5 \rightarrow 3(3a - 5) + 4$

$9a - 15 + 4$

$\boxed{9a - 11}$ → Output

5. Give an example of a *relation* that **is not** a function by a.) Constructing a map and b.) By the use a **function test**.



$\{(2, 5), (3, 5), (3, 7), (4, 7)\}$

Fails test where 3 is mapped to 5 and 7.