

KEY

Math 099

Quiz #1

Name:

Directions: Please show all your work and be neat and organized to receive credit.

1. (9 points) Questions a-c below deal with the relation  $R = \{(3, -2), (-2, 4), (1, -2)\}$ .

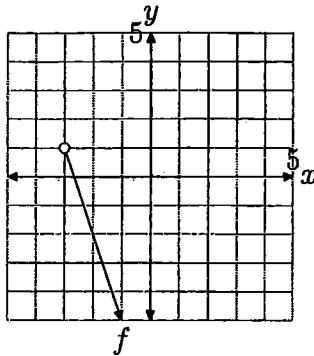
a. What is the domain of this relation?  $D: \{-2, 1, 3\}$  ✓

b. What is the range of this relation?  $R: \{-2, 4\}$  ✓

c. Is the relation a function? Justify your answer.

Yes this is a function. Each input has one output. ✓

2. Use the graph of  $f$  below to answer the following questions:



a. (2 points) Solve the equation  $f(x) = -5$ .

$f(-1) = -5, x = -1 \{-1\}$  ✓

b. (4 points) Find the domain of  $f$ .

$D: \{x | x > -3\}$  ✓

c. (4 points) Find the range of  $f$ .

$R: \{y | y < 1\}$  ✓

4. (4 points) Consider the relation  $\{(A, B) | A \text{ is the father of } B\}$ .

a. (1 point) What is the range of this relation?

$R: \{\text{All children (all ppl really)}\}$  ✓

b. (3 points) Is this relation a function? Justify your answer.

No this is not a function. Each input (parent) can have multiple outputs (kids) ✓

4. Let  $f(x) = \frac{3}{4}x - 1$ .

a. (2 points) Evaluate  $f(12)$ .

$f(12) = \frac{3}{4}(12) - 1 = \frac{3}{1} \cdot \frac{12}{1} - 1 = 9 - 1$  ✓

$f(12) = 8$

b. (5 points) Solve the equation  $f(x) = \frac{5}{9}$ . Fold the paper and do this problem on the back.

Solve:

$$f(x) = \frac{5}{9}$$

$$\frac{3}{4}x - 1 = \frac{5}{9}$$

$$\frac{3}{4}x = \frac{14}{9}$$

$$x = \frac{14}{9} \cdot \frac{4}{3} = \frac{56}{27}$$

$$\left\{ \frac{56}{27} \right\}$$

Check: If  $x = \frac{56}{27}$ , then

$$\frac{3}{4}x - 1 = \frac{3}{4} \cdot \frac{56}{27} - 1$$

$$= \frac{14}{9} - \frac{9}{9}$$

$$= \frac{5}{9} \quad \checkmark$$