Name: **Date:**

Station Activities: Relations Versus Functions/Domain and Range

Station 1

You will be given eight index cards with the following functions and function values written on them:

$$f(x) = 2x; f(x) = -3x + 7; f(x) = x^2; \ f(x) = \frac{2}{3}x; f(3) = 6; f(3) = 9; f(3) = -2; f(3) = 2$$

1. Work together to match each function with its corresponding function value. Write your matches in the space provided.

Evaluate each function for the given expression. Show your work.

2. Let $f(x) = x + 5$. What is $f(x + 3)$?

3. Let $f(t) = t^2$. What is $f(t - 4)$?

4. Let $f(s) = \frac{1}{5}s$. What is $f(s + 4)$?

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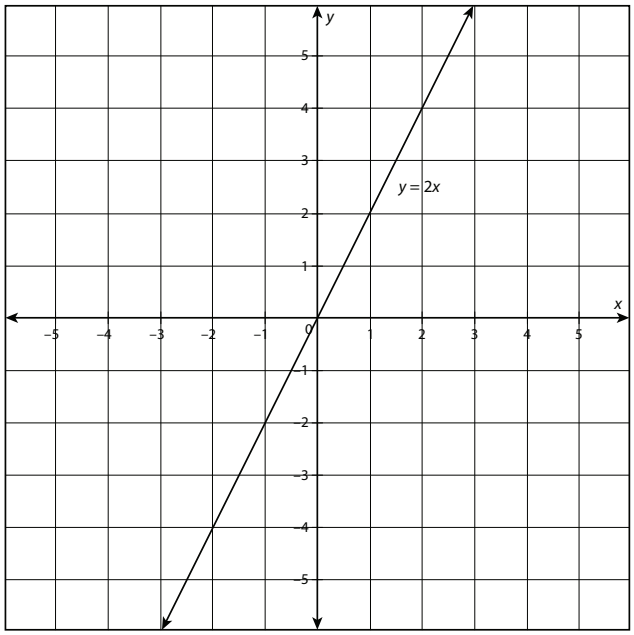
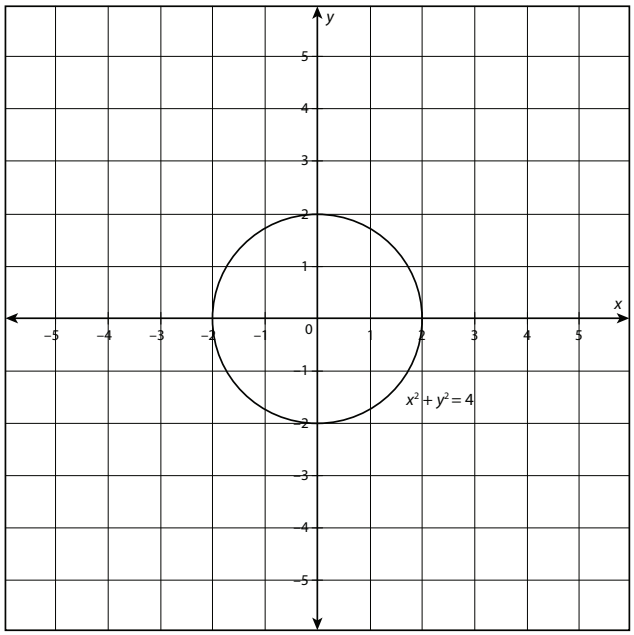
Station 2

You will be given a ruler and graph paper. As a group, use your ruler to determine whether each of the following relations is a function. Beside each graph, write your answer and reasoning.

1. 

2. 

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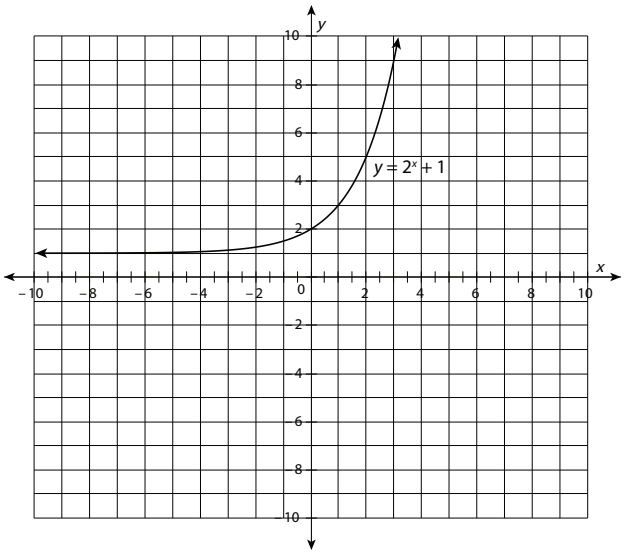
3. 

How did you use your ruler to determine whether each relation was a function?

4. Use your ruler and graph paper to sketch a function. Use the vertical line test to verify that it is a function.

Determine whether each of the following relations is a function. Explain your answer.

5. {(2, 5), (3, 1), (1, 4), (3, 6)}

6. {(1, 1), (2, 1), (3, 2)}

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Station 3

A function f is linear if its equation can be written in the form $f(x) = mx + b$, where m and b are real numbers. Use this information and the problem scenario that follows to answer the questions. You may use a calculator.

> The cost of a sweatshirt is linearly related to the number of sweatshirts ordered. If you buy 100 sweatshirts, then the cost per sweatshirt is \$19. However, if you buy 250 sweatshirts, then the cost per sweatshirt is only \$17.

1. You are given information that determines two points in the function. If x represents the number of sweatshirts and y represents the cost per sweatshirt, write the two ordered pairs represented in the problem scenario above.

2. What is the slope of the function?

3. Find a function which relates the number of sweatshirts and the cost per sweatshirt. Show your work.

4. What would the cost per sweatshirt be for 500 sweatshirts? Explain.

5. What would the cost per sweatshirt be for 60 sweatshirts? Explain.

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Station 4

You will be given a number cube. As a group, roll the number cube and write the result in the first box. Repeat this process until all the boxes contain a number.

$\{(\square, \square), (\square, \square), (\square, \square), (\square, \square)\}$

1. What is the domain of this relation?

2. What is the range of this relation?

3. Is this relation a function? Why or why not?

For problems 4–6, state the domain, range, and whether the relation is a function. Include your reasoning.

4. {(2, 5), (3, 10), (–1, 2), (4, 5)}

5. {(10, 7), (3, 7), (10, 5), (7, 2)}

6. {(–14, 8), (17, 8), (14, –9), (15, 17)}