

Introduction to Relationships - Group Activity

Description/Learning Goals

By the end of class, students will:

- understand that relationships can be represented with equations, tables of values and graphs.
- discover that numerous solutions satisfy an equation.
- Recognize that different equations create different shaped graphs.

Introduction

Put students into pairs or small groups. Put timer on board for 3 minutes. Have each pair/group come up with as many solutions for: the sum of two numbers is 7. When time is up, groups share solutions. Highlight interesting solutions (eg. 7 and 0, negative numbers, decimals).

Discuss equation: $x + y = 7$

How is that different? Is $x = 3$ and $y = 4$ different from $x = 4$ and $y = 3$?

If needed, discuss a second equation: eg. $2x + 3y = 12$

Activity

Hand out materials to each group. Each group gets one equation on a slip of paper (consider which group might be successful with different equations). After suitable time, have groups present their findings. Post each presentation on wall.

Consolidation

Focus on what linear/non-linear looks like when graphed. What clues in the equations could help determine if a relationship is linear?

Highlight initial values in the relationships.

Possible Questions for students:

- Pick 2 graphs that you think are most similar. Explain your choice.
- Sort these graphs into groups. Explain your groupings.

Practice

There are 4 versions of the practice worksheet. All 4 represent linear relationships, but level of difficulty varies.

Instructions

With your group.....

Be sure you have the following materials:

- o Strip of paper with equation
- o Graph paper
- o Scrap paper
- o Chart paper
- o Markers
- o Rulers

Using the scrap paper and graph paper:

1. Find as many solutions for x and y as possible that work in your equation (consider positive and negative numbers, and maybe even decimals).
2. Graph your solutions as a scatter plot.
3. Draw a line or curve to fit the points (relationship).
4. Explain how you found your solutions. What was your method or strategy?
5. Describe the graph.

On the chart paper:

1. Display your equation.
2. Display the points found and your explanation of how they were determined.
3. Display the graph.
4. Describe the graph.

$$x - y = 8$$

$$x = y^2$$

$$y = 2^x$$

$$y = x^3 - 4x$$

$$4x + 2y = 60$$

$$2y = 3x$$

$$y = x^2$$

$$x^2 + y^2 = 25$$

$$xy = 8$$

$$y = \sqrt{x}$$

$$y = \sqrt{25 - x^2}$$

$$y = \frac{(x^2 - 1)^2}{2}$$

Possible Equations

$$x - y = 8$$

$$x = y^2$$

$$y = 2^x$$

$$y = x^3 - 4x$$

$$4x + 2y = 60$$

$$2y = 3x$$

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