

Graphing: A Way to See a Picture of an Equation

Materials Needed: Communicators, erasers and pens
Four Quadrant Grid and Chart
Handout for each student
Rulers

Procedures: Distribute materials to the students. Have them place the Four Quadrant Grid and Chart in the communicators

Do Now: Give students a set of points in a chart and ask them to graph the chart of values on their communicator.

x	-4	-2	2	4	8	10
y	5	4	2	1	-1	-2

After students have graphed the points ask them to draw a line through the 6 points with a ruler and describe at least three other points on the graph. If the students do not mention the x-intercept and y-intercept ask questions that will focus their attention on these two points. Develop the name: x-intercept and y-intercept. Have students write a definition for these in their notes. In the lesson today we will be graphing equations by using the x-intercept and the y-intercept.

Clear the communicators.

Step 1: Assign the equation $x + y = 6$ for the students to enter in the chart. Ask students to describe what this sentence says. (The x value and y value must add up to six.) Ask students to replace the variable x with 0 and describe what the y value will be and record it in the chart. ($x=0, y=6$). Ask students to replace the variable y with 0 and describe what the x value will be and record it in the chart. ($y=0$ and $x = 6$). Ask students to graph the two sets of coordinates from their chart. Ask students to use a ruler to draw the line that passes through the two points. Ask students to identify at least 5 other coordinates that are along the line and record their coordinates on the graph and chart. Ask students what they notice about every pair of points. (The values satisfy the equation when x and y are replaced with the corresponding values.)

Step 2: Have students repeat the procedure discussed in step 1 with the following equations and then locate three other points along each line:

a. $2x + 4y = 12$

c. $3x - 6y = 12$

e. $6x - \frac{1}{3}y = 6$

b. $x - y = 10$

d. $\frac{1}{2}x - y = 4$

f. $2x - y - 8 = 0$

Students should record a picture of each problem on their assignment sheet and record the x-intercept and y-intercept on their sketches.

Assignment: Have students find the graph of each equation using the x-intercept and y-intercept. Have students find at least one other point on each line and show it satisfies the equation.

1. $x - y = 8$

3. $2x + 4y = 8$

5. $\frac{1}{2}x + y = 2$

2. $x - y = -4$

4. $3x - y = 6$

6. $x - 2y - 8 = 0$