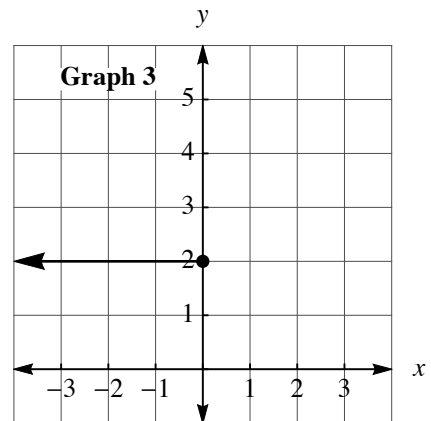
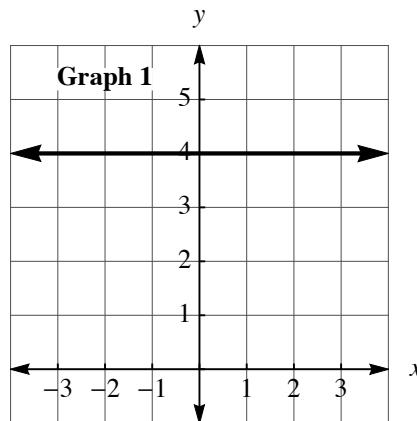
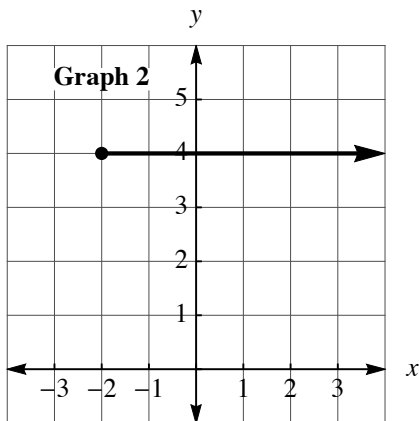


The Equation of a Ray (End-Point Included)

In Graph 1 (below) a horizontal ray that has an end-point of $(-2, 4)$ and extends in the positive x direction is shown. To obtain an equation for this ray, we can begin by obtaining the equation of corresponding line (as shown in Graph 2):

$$y = 4$$



Since this ray only exists when the x -coordinate values are greater than or equal to -2 , we can turn the equation of the line into an equation for the ray by simply stating that the x values must be greater than or equal to -2 . We can do that using an inequality:

$$x \geq -2$$

If we combine the equation of the line with the inequality that specifies the valid x values, we get the equation of a ray:

$$y = 4 \quad \text{and} \quad x \geq -2$$

That's it: an equation for a ray!

Another Example

In Graph 3 (above), a ray is shown on a coordinate plane. Find its equation.

Step 1

Find the equation of the corresponding line:

$$y = 2$$

Step 2

Find the inequality that describes the valid x -values:

$$x \leq 0$$

Step 3

Put the equation and inequality together into a single statement:

$$y = 2 \quad \text{and} \quad x < 0$$