

On a coordinate graph, Andrew places a paperclip at the point (2, 4) and a thumb tack at the point (3, 2). If he draws a line that passes through both of these points, which set of coordinates represents the x- and y-intercepts of the line?

**Solution:**

In our task if we have two points on a straight line, we can always find the slope. This case involves the use of the point-slope formula.

The point-slope formula:

$$m = \frac{\text{change in } y}{\text{change in } x} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{(2 - 4)}{(3 - 2)} = \frac{-2}{1} = -2$$

Now we have the slope and two points. We can find the equation (by solving first for "b") if we have a point and the slope. So we need to pick one of the points (it doesn't matter which one), and use it to solve for *b*. Using the point (2, 4), We get:

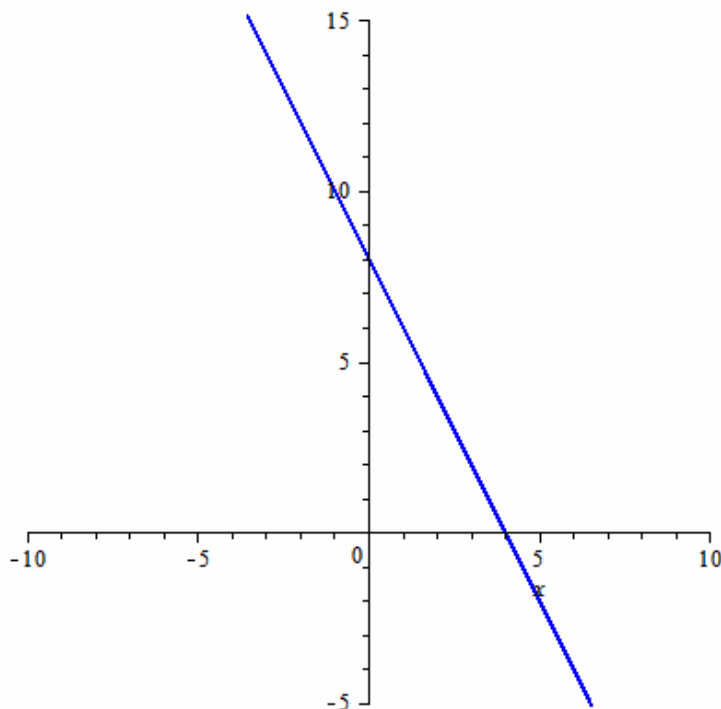
$$y = mx + b$$

$$4 = (-2) \times (2) + b$$

$$4 = -4 + b$$

$$b = 8$$

So, we get equation  $y = -2x + 8$



If  $x = 0$ , then  $y = -2 \times 0 + 8 \Rightarrow y = 8$ , so y-intercept is  $(0,8)$

If  $y = 0$ , then  $-2x + 8 = 0, -2x = -8 \Rightarrow 4$ , so x-intercept is  $(4,0)$

**Answer:** y-intercept is  $(0,8)$  and x-intercept is  $(4,0)$ .