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# Characterization of Parallel Lines



- 1 Graph the line corresponding to the equation  $y = -\frac{3}{4}x + 3$
- 2 Determine if the given pairs of lines are intersecting or parallel.
- 3 Visualize the graphs of parallel lines.
- 4 Determine if the two equations represent parallel or intersecting lines.
- 5 Determine which lines are parallel to each other.
- 6 Determine how many solutions each pair of equations has.
- + with lots of tips, answer keys, and detailed answer explanations for all of the problems.





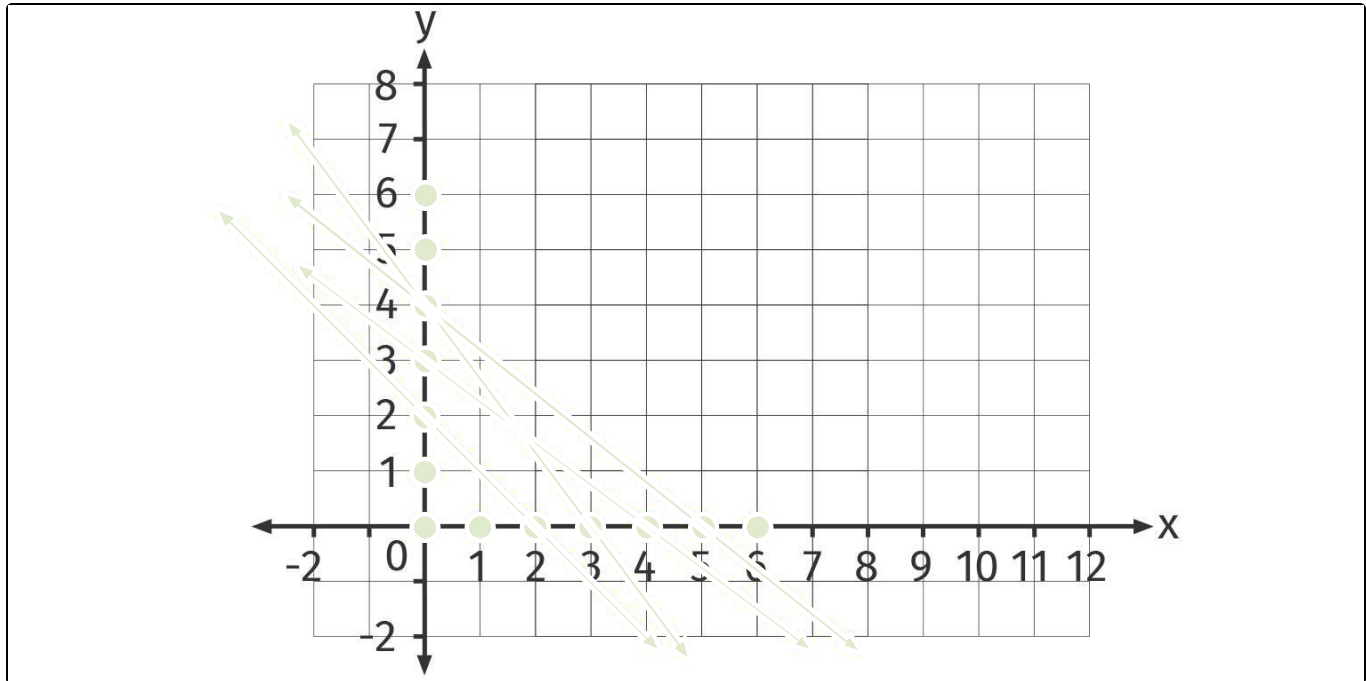
The complete package, including all problems, hints, answers, and detailed answer explanations is available for all [sofatutor.com](https://www.sofatutor.com) subscribers.



## Graph the line corresponding to the equation $y = -\frac{3}{4}x + 3$ .

Highlighter the line, and its  $x$ - and  $y$ -intercept. Use different colors.

 The  $x$ -intercept and the  $y$ -intercept.       The line.





## Hints for solving these problems

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of 6

Graph the line corresponding to the equation  $y = -\frac{3}{4}x + 3$ .

### Hint #1

- Given a line in the form  $y = mx + b$ , the  $y$ -intercept is  $b$ .
  - For example, given the line  $y = -\frac{5}{7}x + 9$ , the  $y$ -intercept is 9.
  - That means the line goes through the point  $(0, 9)$ .
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### Hint #2

- The  $y$ -intercept is the  $y$ -value corresponding to an  $x$ -value of 0.
  - It's the point where the graph crosses the  $y$ -axis.
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### Hint #3

- The  $x$ -intercept is the  $x$ -value corresponding to a  $y$ -value of 0.
  - It's the point where the graph crosses the  $x$ -axis.
- 

### Hint #4

- We can find the  $y$ -intercept for a linear equation by substituting 0 for  $x$  and finding  $y$ .
  - For example, given the equation  $y = 6x - 7$ :  
$$y = 6(0) + 7$$
$$y = 7$$
  - The  $y$ -intercept is 7.
  - That means the graph goes through the point  $(0, 7)$ .
- 

### Hint #5

- We can find the  $x$ -intercept for a linear equation by substituting 0 for  $y$  and finding  $x$ .
  - For example, given the equation  $y = 6x - 7$ :  
$$0 = 6x + 7$$
$$6x = -7$$
$$x = -\frac{7}{6}$$
  - The  $y$ -intercept is  $-\frac{7}{6}$ .
  - That means the graph goes through the point  $(-\frac{7}{6}, 0)$ .
-



## Answers and detailed answer explanations for these problems

1  
of 6

Graph the line corresponding to the equation  $y = -\frac{3}{4}x + 3$ .



The x-intercept and the y-intercept.



The line.



The equation is  $y = -\frac{3}{4}x + 3$

### The $y$ -intercept

- The equation is in slope-intercept form.
- The  $y$ -intercept is 3.
- That means the graph goes through the point  $(0, 3)$ .

### The $x$ -intercept

- We find an  $x$ -intercept by substituting 0 for  $y$  and solving for  $x$ :

$$0 = -\frac{3}{4}x + 3$$

Subtract 3 from both sides.

$$-3 = -\frac{3}{4}x$$

Multiply both sides by  $-\frac{4}{3}$

$$\left(-\frac{4}{3}\right)(-3) = \left(-\frac{4}{3}\right)\left(-\frac{3}{4}x\right)$$

Cancel and reduce.

$$4 = x$$

- The  $x$ -intercept is 4.



## Worksheet: Characterization of Parallel Lines

Mathematics / Middle School / Linear Equations / Systems of Linear Equations and Their Solutions / Characterization of Parallel Lines

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- That means the graph goes through the point  $(4, 0)$ .

The line through  $(0, 3)$  and  $(4, 0)$  is the graph of  $y = -\frac{3}{4}x + 3$ .