

$$y = mx + b$$

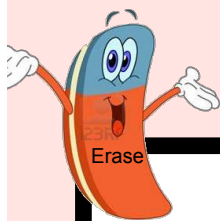
The diagram shows the equation $y = mx + b$. The variables m and b are circled in red. Below each circle is a red hash symbol (#) with a black arrow pointing up to the corresponding variable.

m = Rate of Change (Slope)

b = initial amount (vertical intercept or y-int.)

x = represents the x-axis

y = represents the y-axis

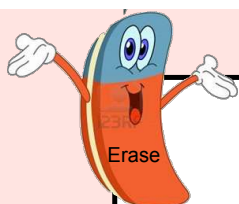


How am I doing?

1. What is the slope of the x-axis? ----- 0 ⁰.
2. Perpendicular lines have opposite reciprocal slopes.
3. What is the slope perpendicular to the y-axis? 0
4. Parallel lines have the same slope.
5. The slope of the y-axis is undefined (1/0).
6. The slope ~~parallel~~ ^{same slope} to -5/7 is -5/7.
7. The slope perpendicular to 6/11 is -11/6.
8. The slope parallel to the y-axis is undefined (1/0).
9. Calculate the slope of (2, -5) (3, 2). _____

$$\frac{2 - (-5)}{3 - 2} = \frac{7}{1} \quad \frac{y_2 - y_1}{x_2 - x_1}$$





1. State the slope and y-int to $y = -3x + 8$

$$\text{Slope} = -3 \quad \text{y-int} = 8$$

2. State the slope and y-int to $y = 2/5x - 3$

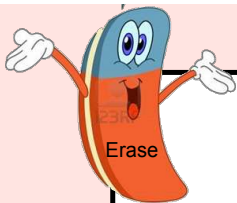
$$\text{Slope} = 2/5 \quad \text{y-int} = -3$$

3. State the slope and y-int to $y = 7 - 2/3x$

$$\text{Slope} = -2/3 \quad \text{y-int} = 7$$

4. State the slope and y-int to $4x - 2 = y$

$$\text{Slope} = 4 \quad \text{y-int} = -2$$



1. State the slope perpendicular to $y = -\frac{3}{8}x - 4$

$$\text{Slope} = \frac{8}{3}$$

2. State the slope parallel to $y = -7x + 3$

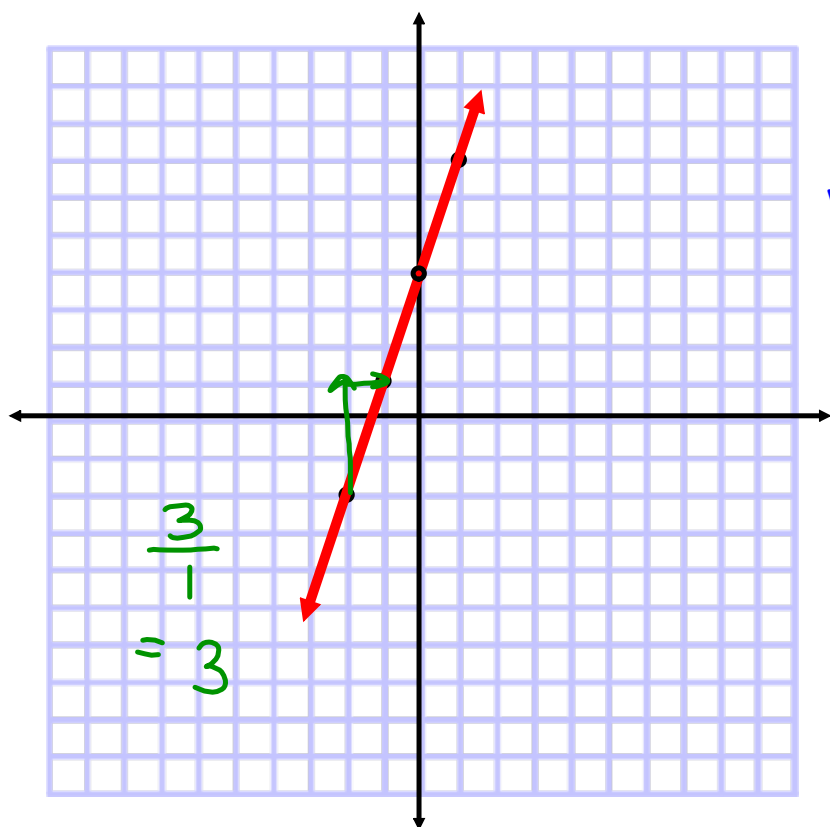
$$\text{Slope} = -7$$

3. State the slope perpendicular to $y = 6x + \frac{2}{3}$

$$\text{Slope} = -\frac{1}{6}$$

4. State the slope perpendicular to $y = -8 - \frac{4}{5}x$

$$\text{Slope} = \frac{5}{4}$$



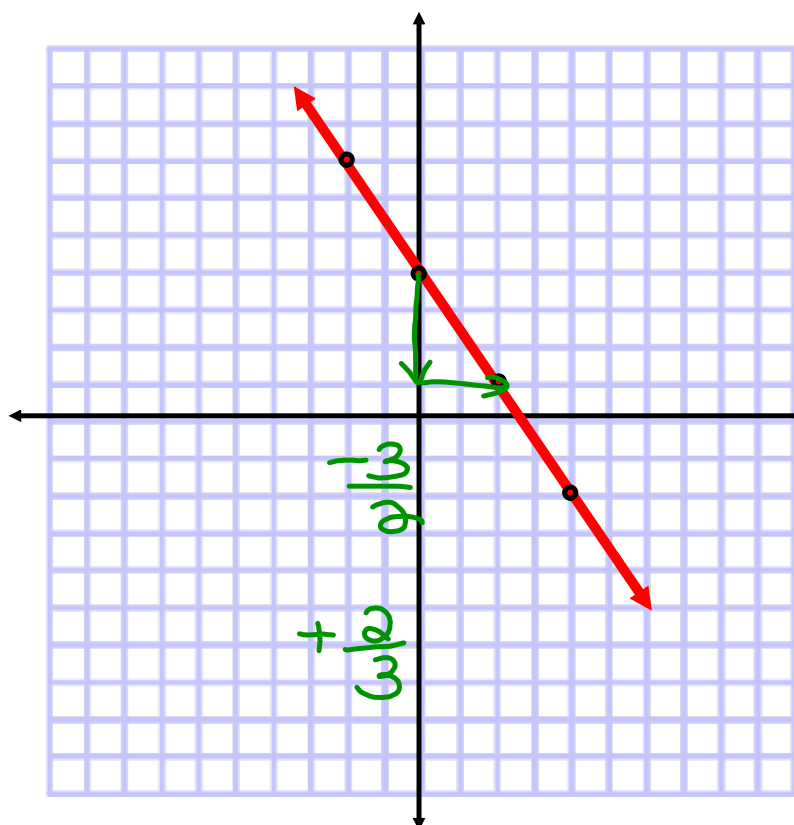
Which line is ^{same slope} ~~parallel?~~

a) $y = \cancel{6}x - 3$

b) $y = \cancel{-3}x - 2$

c) $y = 3x + 8$

d) $y = 2x + 3$



Which line is
perpendicular?

~~a) $y = -\frac{3}{2}x + 1$~~

b) $y = \frac{2}{3}x - 5$

c) $y = \frac{3}{2}x + 6$

d) $y = -\frac{2}{3}x + 3$

Find the ~~perpendicular~~ slope to $2y = 6x - 8$
opp rec. slope

$$\frac{2y}{2} = \frac{6x}{2} - \frac{8}{2}$$

$$y = 3x - 4$$

$$\text{Slope} = \underline{3}$$

$$\text{Answer} = \underline{-\frac{1}{3}}$$

Find the ~~parallel~~ slope to $3y = 2x - 9$
Same Slope

$$\frac{3y}{3} = \frac{2x}{3} - \frac{9}{3}$$
$$y = \left(\frac{2}{3}\right)x - 3$$

$$\text{Slope} = \underline{\frac{2}{3}}$$

$$\text{Answer} = \underline{\frac{2}{3}}$$

Find the ~~perpendicular~~ slope to $2(y - 2) = 4x - 8$

opp rec.

$$\begin{aligned} 2(y - 2) &= 4x - 8 \\ 2y - 4 &= 4x - 8 + 4 \\ 2y &= 4x - 4 \\ y &= 2x - 2 \end{aligned}$$

Slope = 2

Answer = $-\frac{1}{2}$

Find the ~~perpendicular~~ slope to $\frac{y}{2} = 3x - 4$
opp rec.

$$\frac{y}{2} = 3x - 4$$
$$y = 6x - 8$$

$$\text{Slope} = \underline{6}$$

$$\text{Answer} = \underline{-\frac{1}{6}}$$

Find the ~~parallel~~ slope to $3x - 2 = 2y + 4$
same

$$3x - 2 = 2y + 4$$

$$2y + 4 = 3x - 2 - 4$$

$$2y = \frac{3x}{2} - \frac{8}{2}$$

$$y = \left(\frac{3x}{2}\right) - 4$$

$$\text{Slope} = \underline{\underline{\frac{3}{2}}}$$

$$\text{Answer} = \underline{\underline{\frac{3}{2}}}$$

Find the ~~parallel~~ slope to $\frac{1}{3}(y - 2) = 2x - 4$
 same

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

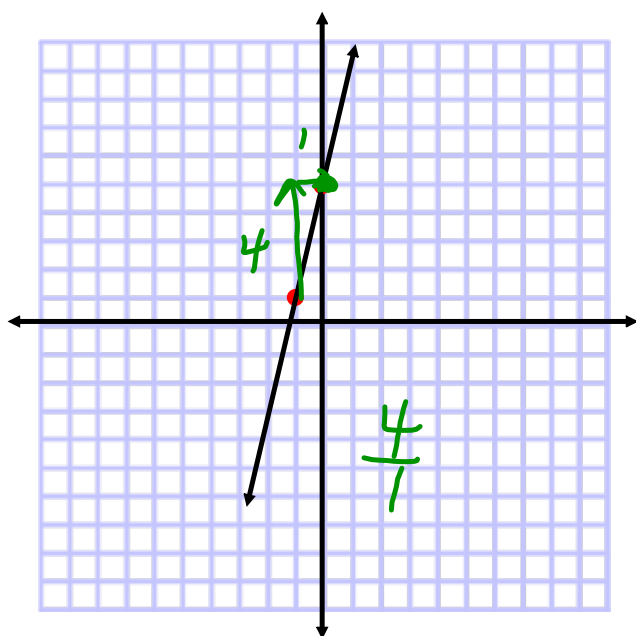
$$1(y - 2) = 6x - 12$$

$$y - 2 = 6x - 12 + 2$$

$$y = 6x - 10$$

$$\text{Slope} = \underline{6}$$

$$\text{Answer} = \underline{6}$$



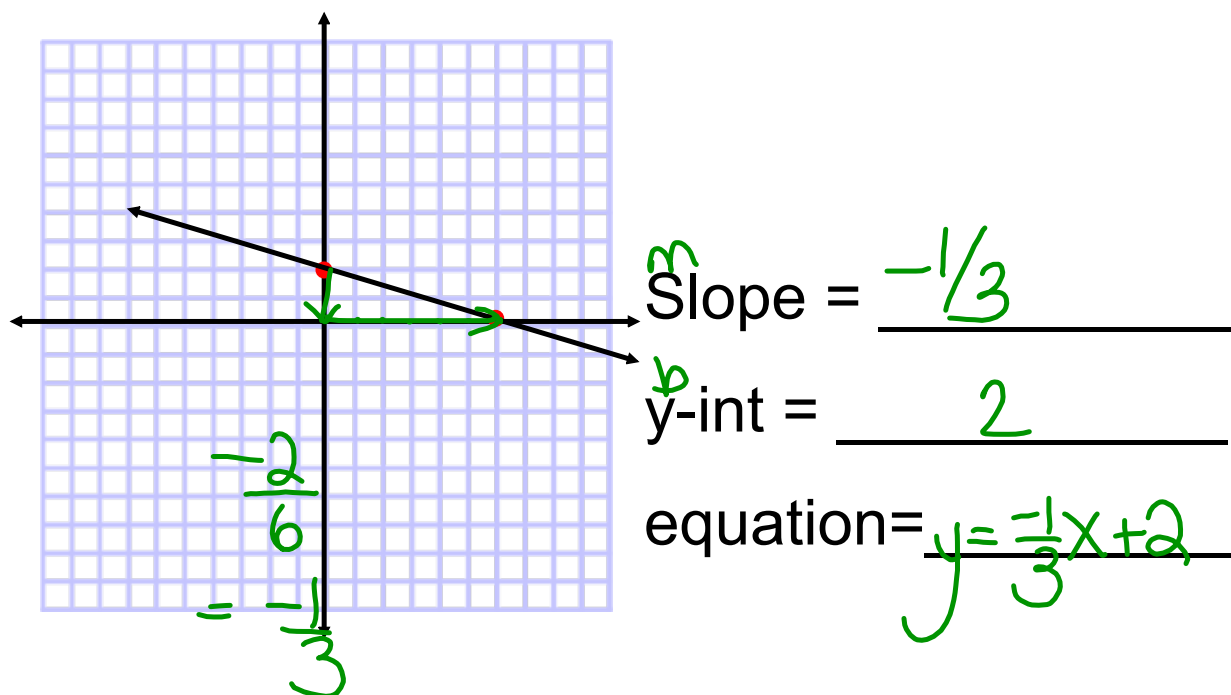
$$\text{Slope} = \frac{4}{1}$$

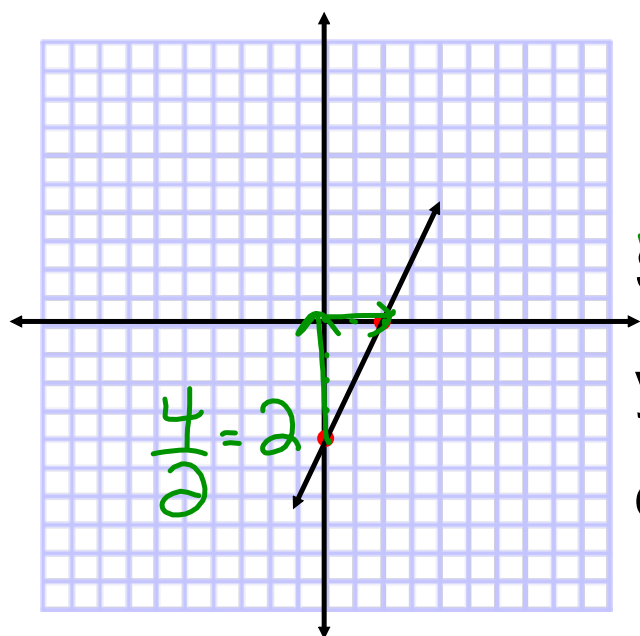
$$\text{y-int} = 5$$

$$\text{equation} = y = 4x + 5$$

$$y = \overset{\#}{\text{m}}x + \overset{\#}{\text{b}}$$

↑ slope ↑ y-int

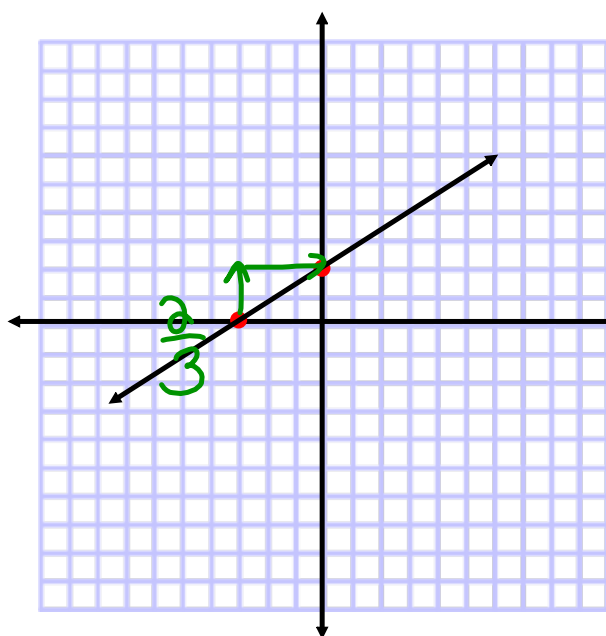




Slope = 2

y-int = -4

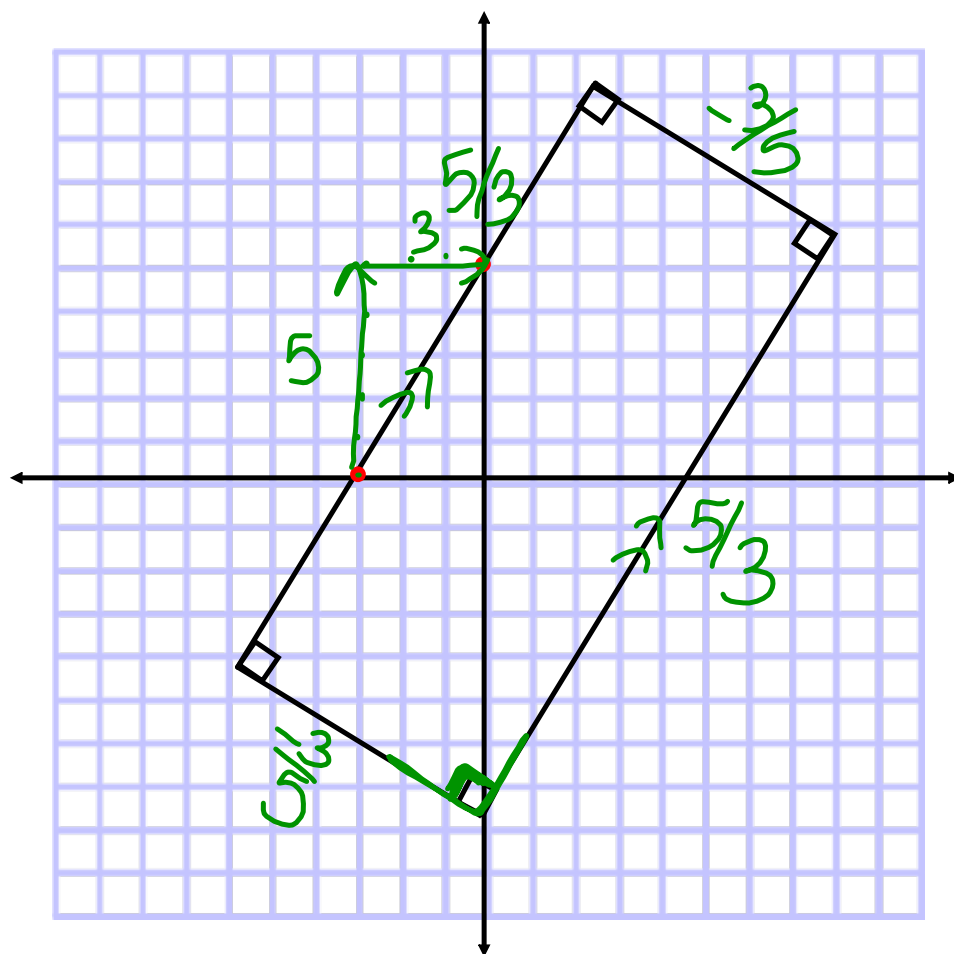
equation = $y = 2x - 4$



$$\text{Slope} = \frac{2}{3}$$

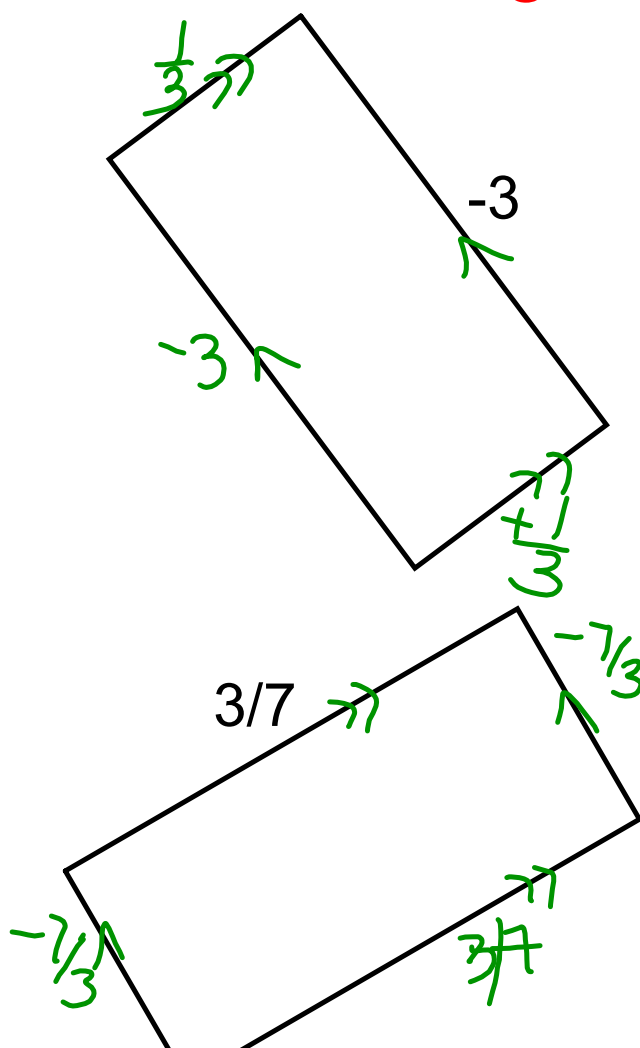
$$\text{y-int} = 2$$

$$\text{equation} = y = \frac{2}{3}x + 2$$



Calculate the slope of each side.

Fill in the missing slopes





- a) Write an equation for the total cost, C dollars, for n months at the gym.
- b) Suppose Karim went to the gym for 23 months. What was the total cost?
- c) Suppose the total cost was \$505. For how many months did Karim use the gym?
- d) Could the total cost be exactly \$600? Justify your answer.





To join the local gym. Karim pays a start-up fee of \$99.00, plus a monthly fee of \$29.00.

m =

b =

x =

y =

- a) Write an equation for the total cost, C dollars, for n months at the gym.
- b) Suppose Karim went to the gym for 23 months. What was the total cost?
- c) Suppose the total cost was \$505. For how many months did Karim use the gym?
- d) Could the total cost be exactly \$600? Justify your answer.

