

WARM UP

Solving the following equations for y . When finished plot each equation on a coordinate plane.

1) $3x + y = 2$

$$y = -3x + 2$$

2) $2x - 2y = -4$

$$-2y = -2x - 4$$

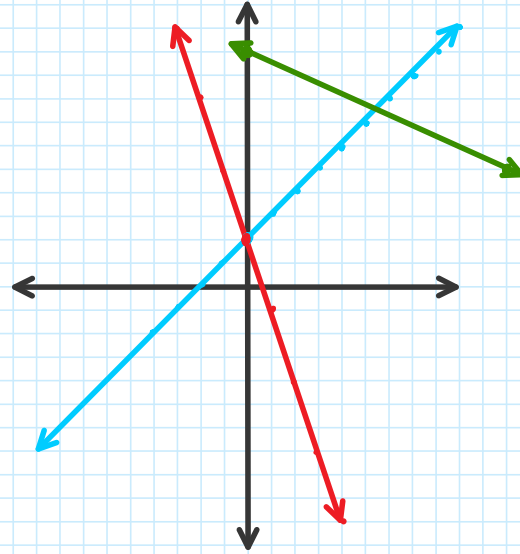
$$y = x + 2$$

3) $\frac{6}{11}x + \frac{6}{5}y = 12$

$$\frac{6}{5}y = -\frac{6}{11}x + 12$$

$$6y = -\frac{30}{11}x + 60$$

$$y = -\frac{5}{11}x + 10$$



ESSENTIAL QUESTION

What information does the slope-intercept form of a linear equation reveal about a line ?

NEEDED VOCAB:

- ▶ **Slope-intercept form**
- ▶ **y-intercept**

GOAL: "I CAN..."

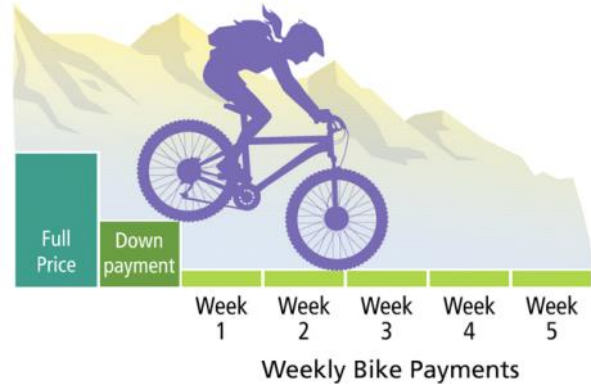
Write and graph linear equations using slope-intercept form."

MODEL AND DISCUSS

Alani wants to buy a \$360 bicycle. She is considering two payment options. The image shows Option A, which consists of making an initial down payment then smaller, equal-sized weekly payments. Option B consists of making 6 equal payments over 6 weeks.

A. What factors should Alani take into consideration before deciding between Option A and Option B?

B. **Communicate Precisely** Suppose Alani could modify Option A and still pay off the bike in 5 weeks. Describe the relationship between the down payment and the weekly payments.

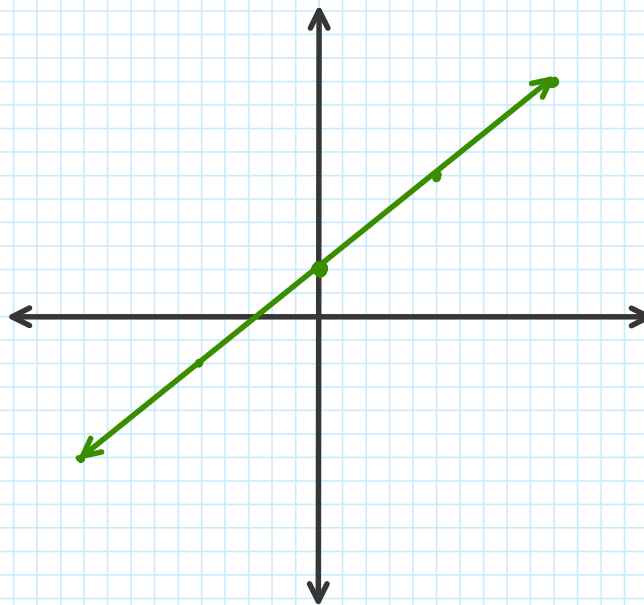


A. How much can she afford now, and how much does she have per week.

B. The higher the down payment the smaller the weekly payments need to be.

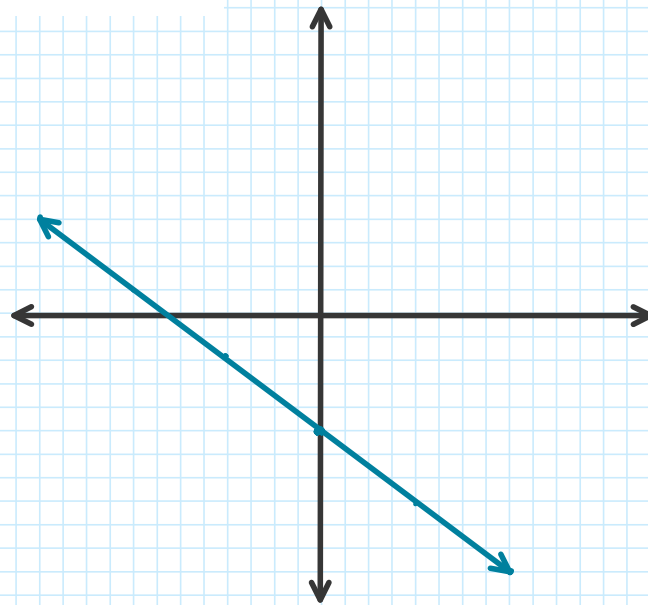
A) EXAMPLE 1

What is the graph of $y = \frac{4}{5}x + 2$?



1. Sketch the graph of $y = -\frac{3}{4}x - 5$.





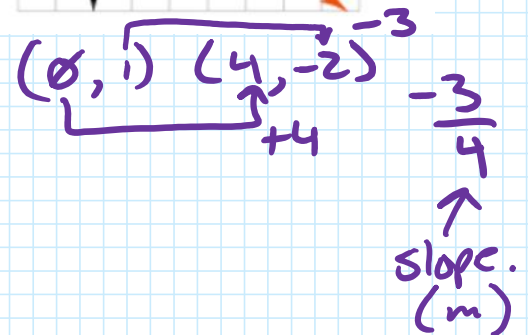
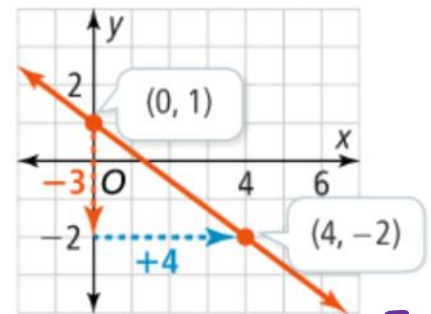
B) EXAMPLE 2

What is the equation of the line in slope-intercept form?

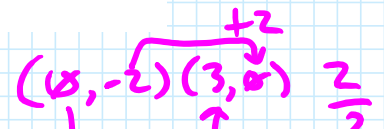
y-intercept is always
 When $x=0$
 so y-intercept is
 $(0, b)$

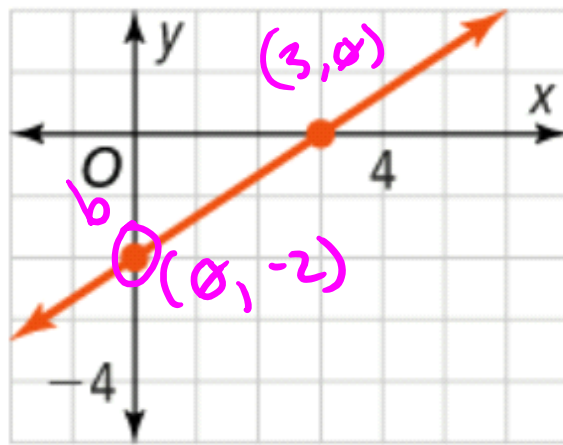
$$y = mx + b$$

$$y = -\frac{3}{4}x + 1$$



2. Write the equation of the line in slope-intercept form.





$$\begin{matrix} (0, -2) & (3, 0) \\ \swarrow & \searrow \\ & +3 \\ & \frac{2}{3} \end{matrix}$$

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

C) EXAMPLE 3

How can you find an equation of a line that passes through two points if neither of them is the y-intercept? Consider the line that passes through the points $(-1, -2)$ and $(3, 4)$.

Use the points to find slope. then calculate b by substitution

$$\begin{matrix} [(-1, -2)] & (3, 4) \\ \swarrow & \searrow \\ & +4 \\ \frac{6}{4} & \frac{3}{2} = m \end{matrix}$$

$$\begin{aligned} y &= \frac{3}{2}x + b \\ -2 &= \frac{3}{2}(-1) + b \\ -2 &= -\frac{3}{2} + b \\ -2 + 1.5 &= b \\ -.5 &= b \\ &= -\frac{1}{2} \end{aligned}$$

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

3. Write the equation in slope-intercept form of the line that passes through the points $(5, 4)$ and $(-1, 6)$.

$$\begin{matrix} (5, 4) & (-1, 6) \\ \swarrow & \searrow \\ & +2 \\ -6 & -\frac{2}{6} \rightarrow -\frac{1}{3} = m \end{matrix}$$

$$\begin{aligned} 4 &= -\frac{1}{3}(5) + b \\ 4 &= -\frac{5}{3} + b \end{aligned}$$

$$y = -\frac{1}{3}x + \frac{17}{3}$$

$$4 = -\frac{5}{3} + b$$

$$4 + \frac{5}{3} = b$$

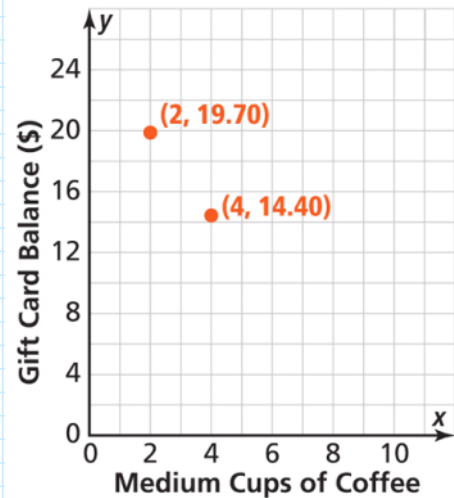
$$\frac{12}{3} + \frac{5}{3} = b$$

$$\frac{17}{3} = b$$

$$y = -\frac{1}{3}x + \frac{17}{3}$$

D) EXAMPLE 4

Allie received a gift card for her local coffee shop. Every time she goes to the shop, she gets a medium coffee. The graph shows the gift card balance at two points. How can Allie determine the number of medium coffees she can buy with the gift card if she does not know the original value of the card?



Find the x-intercept.

(When $y = 0$)

↑
no more money on the card.

4. Find the x-intercept of the graph of the equation $y = -2.65x + 25$. What does the x-intercept mean in terms of the situation?

$$y = -2.65x + 25$$

$$0 = -2.65x + 25$$

$$-25 = -2.65x$$

$$9.43 \approx x$$

means she can buy

9 med. cups of coffee.

WORDS

The slope-intercept form of a linear equation is used when the slope and the y-intercept of a line are known.

ALGEBRA

The slope-intercept form of a line is $y = mx + b$.

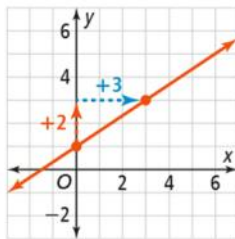
slope

y-intercept

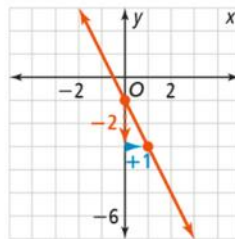
NUMBERS

$$y = \frac{2}{3}x + 1$$

$$y = -2x - 1$$

GRAPH

The line has a slope of $\frac{2}{3}$.
The y-intercept is 1.



The line has a slope of -2 .
The y-intercept is -1 .

HOMework

Pg. 61

13-15, 17, 18-32 EVEN, 34, 39

