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Warm-Up | Comparing Slopes and Intercepts

? Lesson Question

◎ Lesson Goals

Analyze linear functions expressed in different forms.

Determine [ ] and *y*-intercepts of linear functions.

Compare characteristics of [ ] functions.

W2K Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you
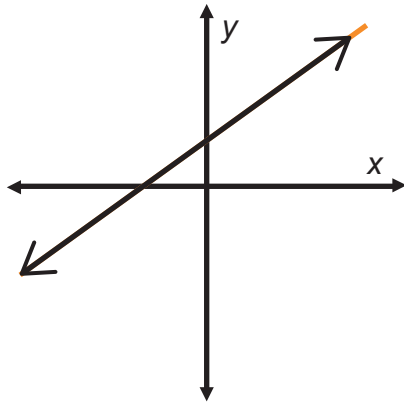
	to find the place of something
	the ratio of the change in the dependent values (outputs) to the change in the independent values (inputs) between two points on a line
	the *y*-coordinate of the point where the graph of a line crosses the *y*-axis
	a function that can be written in the form $y = mx + b$, where m and b are real numbers; consists of a set of ordered pairs all lying on the same line

Reviewing Ways to Represent a Linear Function

x	y
−2	5
−1	2
0	−1
1	−4

(−2, 5)

$$y = \boxed{} + b$$

$y = -3x + 17$

$y = 4x - 0.15$

$y = -x$
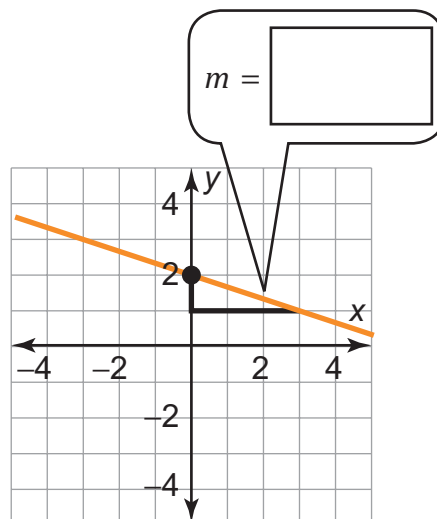
Graph

Equations

Slide 2

Linear Function Representations

A linear function has a **slope** of $-\dfrac{1}{3}$ and a **y-intercept** of 2.

x	y
−1	$2\dfrac{1}{3}$
0	2
1	$1\dfrac{2}{3}$

$$y = -\dfrac{1}{3}x + 2$$

$y = mx + \boxed{}$

$m = \boxed{}$

$\boxed{}$	Equation	Graph

Slide 4

Comparing the Slopes

Up or Down (sign of the slope)

- $\boxed{}$ slopes trend upward: *y* increases as *x* increases, left to right.

- Negative slopes trend $\boxed{}$: *y* decreases as *x* increases, left to right.

$y = 2x + \boxed{}$ $y = \boxed{} + 4$
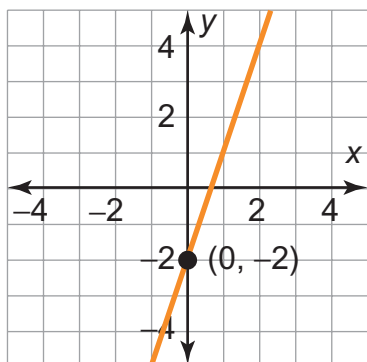
Steepness (absolute value of the slope)

- Larger slope means a [   ] line (consider only the number, not the sign).

- Slope close to zero means it is [   ] to horizontal.

$y = 4x +$ [   ] $y =$ [   ] $+ 6$
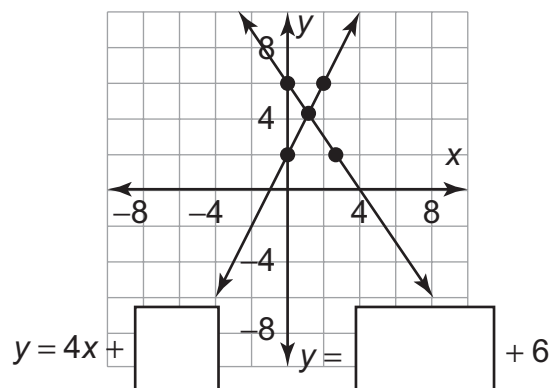
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Finding the _y_-Intercept

EXAMPLE

- **Locate** the _y_-intercept of the linear function represented in the graph.

- **Locate** the _y_-intercept of the linear function represented in an equation written in slope-[   ] form.

$$y = mx + b$$

$b =$ [   ]

$y =$ [   ] $+ 4$

- Which function has a larger _y_-intercept?

The [   ] is the function that has the larger _y_-intercept.

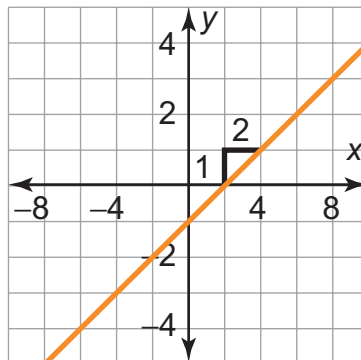(0, −2)

Instruction | Comparing Slopes and Intercepts

Representing Slopes of Linear Functions

EXAMPLE

x	y
−4	−14
−1	−5
1 x_1	1 y_1
3 x_2	7 y_2
8	22

(rows labeled 1 and 2 next to the x_1, y_1 and x_2, y_2 rows)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\boxed{} - 1}{3 - \boxed{}} = \frac{6}{2} = 3$$

- Find the slope of the linear function from data in the table.

  $m = \boxed{}$

- Find the slope of the linear function expressed in the graph.

  $m = \boxed{}$

- Compare the slopes.

  Both are $\boxed{}$.

  So, the slope of $m = 3$ is the $\boxed{}$ function.

- Compare the two linear functions.

  The function represented in the $\boxed{}$ is positive and has a steeper

  slope than the function represented in the $\boxed{}$.

Representing Intercepts of Linear Functions

EXAMPLE

Compare the two linear functions.

x	y
−4	−14
−1	−5
1 x_1	1 y_1
3 x_2	7 y_2
8	22

(0, −1)
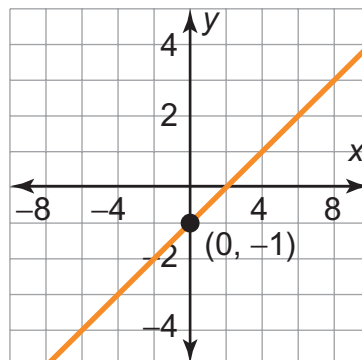
$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 1}{3 - 1} = \frac{\boxed{}}{2} = \boxed{}$$

$$1 = 3(1) + b$$
$$1 = 3 + b$$
$$b = \boxed{}$$

- Find the *y*-intercept of the linear function from the data in the table.

  $b = \boxed{}$.

- Find the *y*-intercept of the linear function expressed in the graph.

  $b = \boxed{}$.

- Which function has a larger *y*-intercept? $\boxed{}$

  Negative 1 is larger than negative 2, so the $\boxed{}$ function has the larger *y*-intercept.

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Summary | Comparing Slopes and Intercepts

? | **Lesson Question** | How can you determine the characteristics of linear functions that are represented in different ways?

✓ | **Answer**

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2 | **Review: Key Concepts**

A linear function with the same slope and *y*-intercept can be [ ] in different ways.

A linear function has a slope of 2 and a *y*-intercept of −3.

x	y
−2	−7
0	−3
2	1

$y = 2x - 3$

$y = \boxed{} + b$

$m = \dfrac{4}{2} = \boxed{}$

$m = 2$
$(0, -3)$
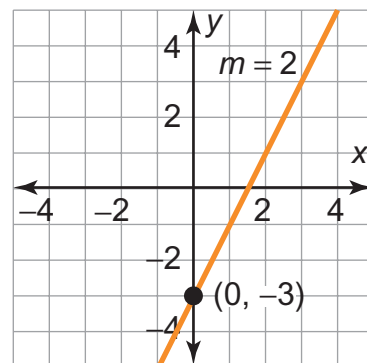
| Words | Table | Equation | Graph |

Summary | Comparing Slopes and Intercepts

Use this space to write any questions or thoughts about this lesson.