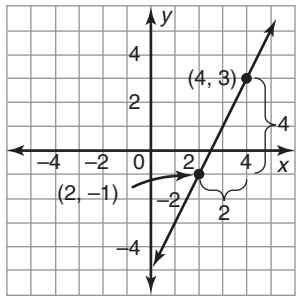
Name _____ Class _____ Date _____

Reteaching 4-1

Understanding Slope

The *slope of a line* is $\frac{\text{change in } y}{\text{change in } x}$, found by using two points on the line.



Find the slope of the line that passes through these two points: (4, 3) and (2, −1).

- To find the change in *y,* subtract one *y*-coordinate from the other: $(3 - (-1)) = 4$.
- To find the change in *x,* subtract one *x*-coordinate from the other: $(4 - 2) = 2$.

When you find the slope of a line, the *y*-coordinate you use first for the rise must belong to the same point as the *x*-coordinate you use first for the run.

The slope of the line is: $\frac{\text{change in } y}{\text{change in } x} = \frac{3 - (-1)}{4 - 2} = \frac{4}{2} = 2$

A table of values from the graph also shows the slope.

−1 *change in x*

x	5	4	3	2	1
y	5	3	1	−1	−3

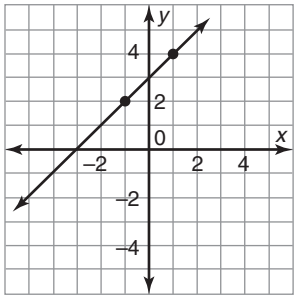
−2 *change in y*

Compare the change in each coordinate.

$\frac{\text{change in } y}{\text{change in } x} = \frac{-2}{-1} = 2$

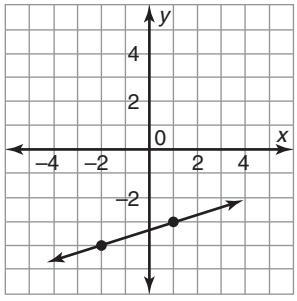
Find the slope of each line.

1.



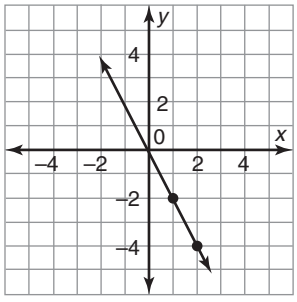
slope = _____

2.



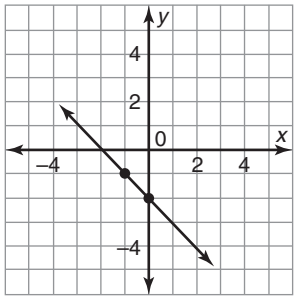
slope = _____

3.



slope = _____

4.



slope = _____

Name _____ Class _____ Date _____

Reteaching 4-2

Graphing Linear Functions

You can graph a function in the coordinate plane. To plot points for the graph, use *input* as x-values (x-axis) and *output* as y-values (y-axis).

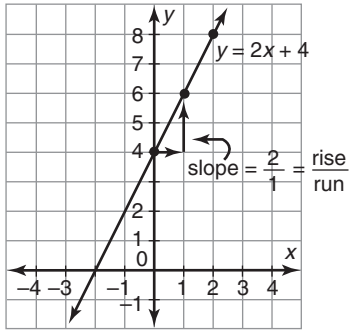
output as y-values *input as x-values*

$$\begin{array}{cc} \downarrow & \downarrow \\ y & = 2x + 4 \end{array}$$

This function has the form of a linear equation and is called a *linear function.* To draw its graph, use

slope and y-intercept:

$y = 2x + 4$
slope $= 2$
y-intercept $= 4$



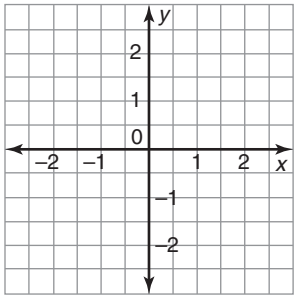
or

plot points from a table and connect them in a line.

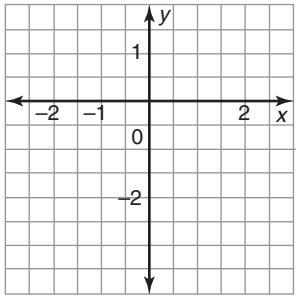
x	y
0	4
1	6
2	8

Graph each linear function.

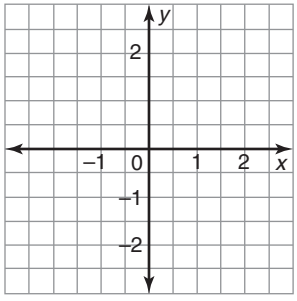
1. $y = 3x$



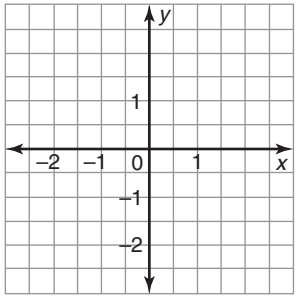
2. $y = 2x - 2$



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



4. $y = 2 - x$



Name _____ Class _____ Date _____

Reteaching 4-3

Writing Rules for Linear Functions

Sometimes you can write a function rule to describe a situation.

Cookies at a bazaar sell for \$2 each. The booth costs \$25 to rent for the day. The profit depends on how many cookies are sold.

Words: Profit = 2 × (number of cookies sold) − \$25

Function rule: $y = 2x - 25$

The output y is the profit.

The input x is the number of cookies sold.

You can use the graph of a linear function to write its function rule. First, you need to find the slope and the y-intercept.

① From the graph, the slope (m) is $-\frac{1}{2}$.

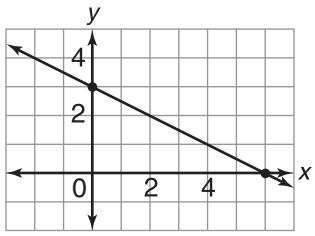
② The point $(0, 3)$ is on the graph so the y-intercept (b) is 3.

③ Substitute in the slope-intercept form.

$$y = mx + b$$

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

The function rule is $y = -\frac{1}{2}x + 3$.



Write a function rule for each situation. Identify the x and y variables.

1. A person burns 350 calories for every hour of bicycling. The number of calories burned is a function of the number of hours spent bicycling.

_____

_____

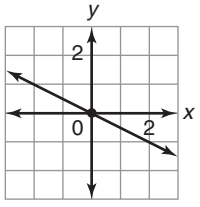
2. Janice earns \$150 a week plus a commission of \$3 for every magazine she sells. Her total pay depends on how many magazines she sells.

_____

_____

Identify the slope and y-intercept of each graph. Then write a linear function rule.

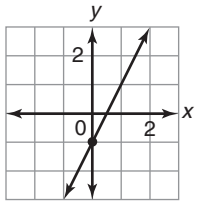
3.



_____

_____

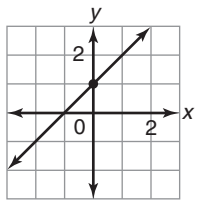
4.



_____

_____

5.



_____

_____

Name _____ Class _____ Date _____

Reteaching 4-4

Comparing Functions

Find the slope to compare the rate of change.

Use two values from a table.

x	1	2	3	4
y	1	4	7	10

(2, 4) and (4, 10)

slope $= \frac{10 - 4}{4 - 2} = \frac{6}{2} = 3$

Use the equation $y = mx + b$.

$y = 2x + 5$

$y = mx + b.$

↓ The slope is m, which is 2.

$y = 2x + 5$

$3 > 2$, so the function in the table has the greater rate of change.

For Questions 1–4, match each linear function with its rate of change.

1. Austin pays a registration fee of $10 plus $1 for every audiobook he borrows.

A. 4

2.

x	1	3	4	6
y	5	9	11	15

B. 3

3. (1, 5), (2, 9)

C. 2

4. $y = 3x - 1$

D. 1

5. Which function has the greater rate of change?

$y = 2x - 4$

x	2	3	4	5
y	1	2	3	4