Name _____ Date _____ Class _____

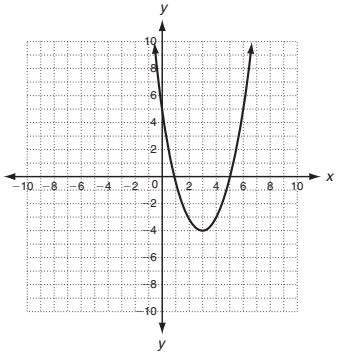
LESSON 5-1

Practice B

Identifying Linear Functions

Identify whether each graph represents a function. Explain. If the graph does represent a function, is the function linear?

1.



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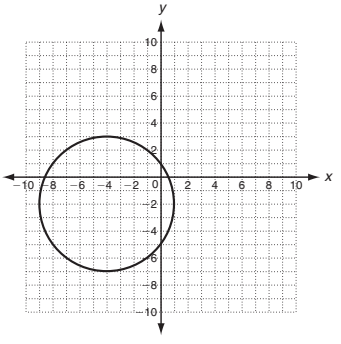
2.



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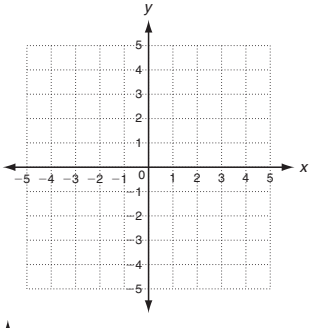
3. Which set of ordered pairs satisfies a linear function? Explain.

Set A: $\{(5, 1), (4, 4), (3, 9), (2, 16), (1, 25)\}$ _____

Set B: $\{(1, -5), (2, -3), (3, -1), (4, 1), (5, 3)\}$ _____

4. Write $y = -2x$ in standard form. Then graph the function.



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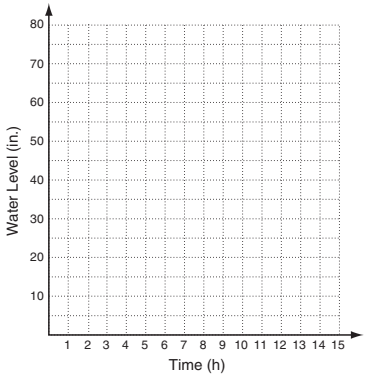
5. In 2005, the Shabelle River in Somalia rose an estimated 5.25 inches every hour for 15 hours. The increase in water level is represented by the function $f(x) = 5.25x$, where x is the number of hours. Graph this function and give its domain and range.



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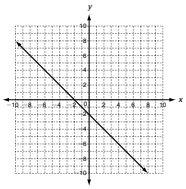
LESSON 5-1

Practice A

Identifying Linear Functions

Use the graph for 1–3.



1. Is this graph a function? yes
2. Explain how you know it is a function. Each domain value is paired with exactly one range value.
3. If this graph is a function, is it also a linear function? yes

Use the set {(1, 8), (2, 6), (3, 4), (4, 2), (5, 0)} for 4–5.

4. Does the set of ordered pairs satisfy a linear function? yes
5. Explain how you decided. A constant change of +1 in x corresponds to a constant change of −2 in y.

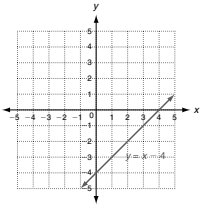
6. Write the equation $y = x - 4$ in standard form $(Ax + By = C)$.

$-x + y = -4$

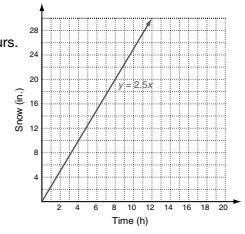
7. Is $y = x - 4$ a linear function?

yes

8. Graph $y = x - 4$ to check.



9. In 2005, a storm in Milwaukee, WI was dropping 2.5 inches of snow every hour. The total amount of snow is given by $f(x) = 2.5x$, where x is the number of hours. Graph this function and give its domain and range.



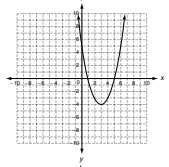
D: $x \geq 0$; R: $y \geq 0$

LESSON 5-1

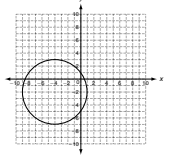
Practice B

Identifying Linear Functions

Identify whether each graph represents a function. Explain. If the graph does represent a function, is the function linear?

1. 

function (not linear); each domain value is paired with exactly one range value.

2. 

not a function; several domain values are paired with two range values.

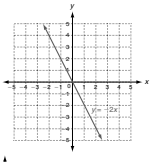
3. Which set of ordered pairs satisfies a linear function? Explain.

Set A: {(5, 1), (4, 4), (3, 9), (2, 16), (1, 25)}

Set B: {(1, −5), (2, −3), (3, −1), (4, 1), (5, 3)}

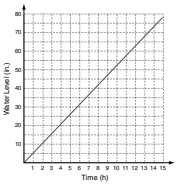
Set B; A constant change of +1 in x corresponds to a constant change of +2 in y.

4. Write $y = -2x$ in standard form. Then graph the function.



$2x + y = 0$

5. In 2005, the Shabelle River in Somalia rose an estimated 5.25 inches every hour for 15 hours. The increase in water level is represented by the function $f(x) = 5.25x$, where x is the number of hours. Graph this function and give its domain and range.



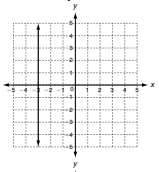
D: $0 \leq x \leq 15$; R: $0 \leq y \leq 78.75$

LESSON 5-1

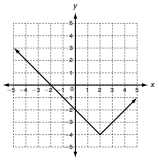
Practice C

Identifying Linear Functions

Identify whether each graph represents a function. Explain. If the graph does represent a function, is the function linear?

1. 

not a function; One domain value is paired with an infinite number of range values.

2. 

nonlinear function; Each domain value is paired with exactly one range value.

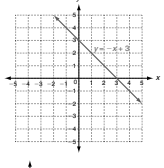
3. Which of the sets of ordered pairs satisfies a linear function? Explain.

Set A: {(−10, 3), (−9.9, 4.5), (−9.8, 6), (−9.7, 7.5)}

Set B: {(1, 5), (2, 10), (4, 15), (8, 20), (16, 25)}

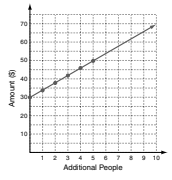
Set A; A constant change of +0.1 in x corresponds to a constant change of +1.5 in y.

4. Write $y = -x + 3$ in standard form. Then graph the function.



$x + y = 3$

5. A campground charges $30 for 2 people plus $4 for each additional person. The total amount owed is given by $f(x) = 30 + 4x$ where x is the number of additional people. Graph this function and give its domain and range.



D: {0, 1, 2, 3, 4, …};
R: {$30, $34, $38, $42, $46…}

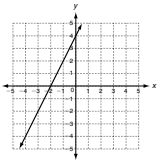
LESSON 5-1

Reteach

Identifying Linear Functions

You can determine if a function is linear by its graph, ordered pairs, or equation.

Identify whether the graph represents a linear function.



Step 1: Determine whether the graph is a function.

Every x-value is paired with exactly one y-value; therefore, the graph is a function. Continue to step 2.

Step 2: Determine whether the graph is a straight line.

Conclusion: Because this graph is a function and a straight line, this graph represents a linear function.

Identify whether {(4, 3), (6, 4), (8, 6)} represents a linear function.

Step 1: Write the ordered pairs in a table.

Step 2: Find the amount of change in each variable. Determine if the amounts are constant.

x	y
4	3
6	4
8	6

(+2, +1; +2, +2)

Conclusion: Although the x-values show a constant change, the y-values do not. Therefore, this set of ordered pairs does not represent a linear function.

Identify whether the function $y = 5x - 2$ is a linear function.

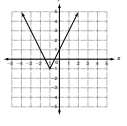
Try to write the equation in standard form $(Ax + By = C)$.

$y = 5x - 2$
$-5x \quad -5x$
$-5x + y = -2$

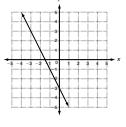
In standard form, x and y
- have exponents of 1
- are not multiplied together
- are not in denominators, exponents, or radical signs

Conclusion: Because the function can be written in standard form, (A = −5, B = 1, C = −2), the function is a linear function.

Tell whether each graph, set of ordered pairs, or equation represents a linear function. Write *yes* or *no*.

1. 

no

2. 

yes

3.

x	y
−9	5
−5	10
−1	15

yes

4. {(−3, 5), (−2, 8), (−1, 12)} no

5. $2y = -3x^2$ no

6. $y = 4x - 7$ yes