

LESSON

Reteach

5-1 Identifying Linear Functions

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

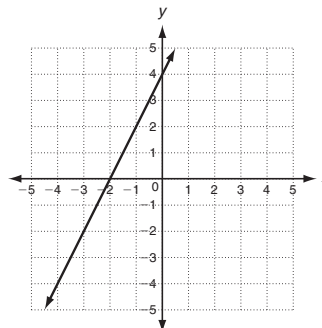
Identify whether the graph represents a linear function.

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.

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.

| x | y |
|-----|-----|
| 4 | 3 |
| 6 | 4 |
| 8 | 6 |

Arrows indicate changes: $+2$ between x values, and $+1$ and $+2$ between y values.

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

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

$$y = 5x - 2$$

$$\frac{-5x}{-5x} \frac{-5x}{-5x}$$

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

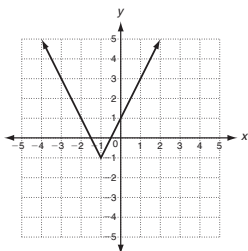
In standard form, x and y

- have exponents of 1
- are not multiplied together
- are not in denominators, exponents, or radical signs

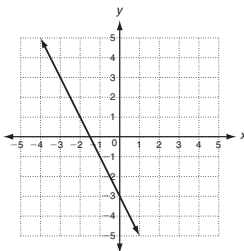
Conclusion: Because the function can be written in standard form, ($A = -5, B = 1, C = -2$), the function is a linear function.

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

1.



2.



3.

| x | y |
|-----|-----|
| -9 | 5 |
| -5 | 10 |
| -1 | 15 |

4. $\{(-3, 5), (-2, 8), (-1, 12)\}$

5. $2y = -3x^2$

6. $y = 4x - 7$

LESSON

Reteach

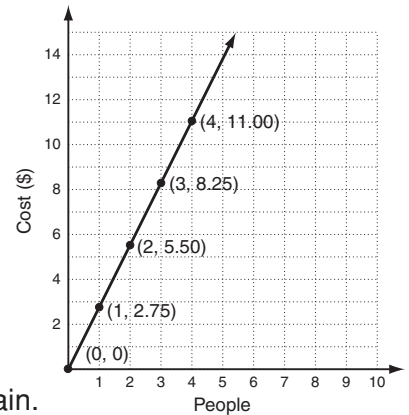
5-1 Identifying Linear Functions (continued)

In real-life problems, the domain and range are sometimes restricted.

Swimming at the park pool costs \$2.75 for each person. The total cost is given by $f(x) = 2.75x$ where x is the number of people going swimming. Graph this function and give its domain and range.

Step 1: Graph.

| x | $f(x) = 2.75x$ |
|-----|-------------------------|
| 0 | $f(0) = 2.75(0) = 0$ |
| 1 | $f(1) = 2.75(1) = 2.75$ |
| 2 | $f(2) = 2.75(2) = 5.50$ |
| 3 | $f(3) = 2.75(3) = 8.25$ |



Step 2: Determine the domain and range.

Ask yourself the following questions to help determine the domain.

Can the x -value be all fractions or decimals in between the whole numbers?

Can the x -value be 0?

Can the x -value be negative?

The domain is the number of people. So the domain is restricted to whole numbers.

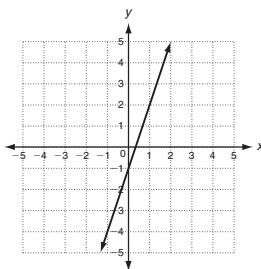
Because the range is determined by the domain, it is also restricted.

Domain: $\{0, 1, 2, 3, \dots\}$

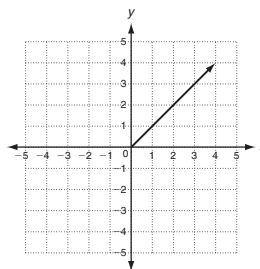
Range: $\{\$0, \$2.75, \$5.50, \$8.25, \dots\}$

Give the domain and range for the graphs below.

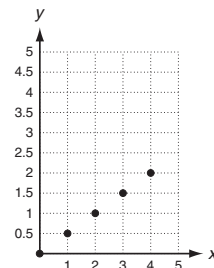
7.



8.



9.



10. Tyler makes \$10 per hour at his job. The function $f(x) = 10x$ gives the amount of money Tyler makes after x hours. Graph this function and give its domain and range.

