5 Chapter Review

Check It Out
Vocabulary Help
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Review Key Vocabulary

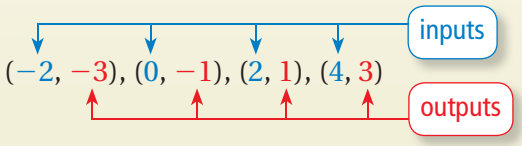
function, *p. 204*
domain, *p. 204*
range, *p. 204*
independent variable, *p. 204*
dependent variable, *p. 204*
relation, *p. 208*
Vertical Line Test, *p. 209*
discrete domain, *p. 212*
continuous domain, *p. 212*
linear function, *p. 218*
function notation, *p. 226*
piecewise function, *p. 232*
step function, *p. 233*
absolute value function, *p. 234*
nonlinear function, *p. 238*
sequence, *p. 244*
term, *p. 244*
arithmetic sequence, *p. 244*
common difference, *p. 244*

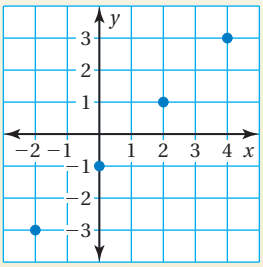
Review Examples and Exercises

5.1 Domain and Range of a Function *(pp. 202–209)*

Find the domain and range of the function represented by the graph.

Write the ordered pairs. Identify the inputs and outputs.



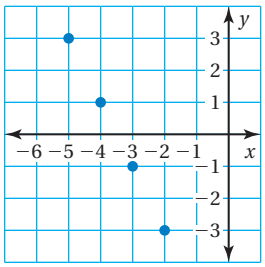


∴ The domain is −2, 0, 2, and 4.
The range is −3, −1, 1, and 3.

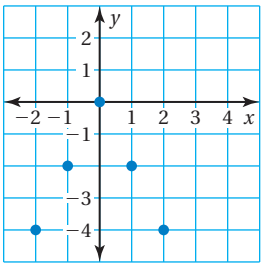
Exercises

Find the domain and range of the function represented by the graph.

1.



2.

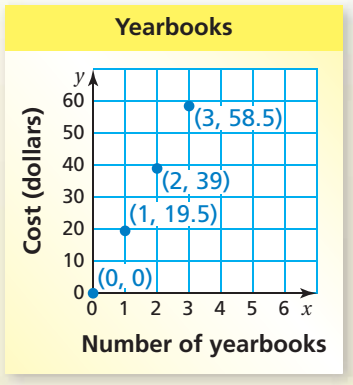


5.2 Discrete and Continuous Domains *(pp. 210–215)*

A yearbook costs $19.50. The graph shows the cost *y* of *x* yearbooks. Is the domain discrete or continuous?

Because you cannot buy part of a yearbook, the graph consists of individual points.

∴ So, the domain is discrete.



Exercises

Graph the function. Is the domain discrete or continuous?

3.

Hours, x	0	1	2	3	4
Miles, y	0	4	8	12	16

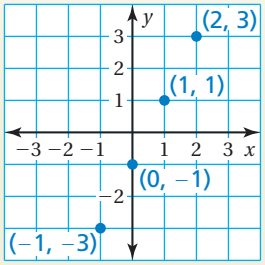
4.

Stamps, x	20	40	60	80	100
Cost, y	8.4	16.8	25.2	33.6	42

5.3 Linear Function Patterns *(pp. 216–221)*

Use the graph to write a linear function that relates y to x.

The points lie on a line. Find the slope and y-intercept of the line.



$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{3-1}{2-1} = \frac{2}{1} = 2$$

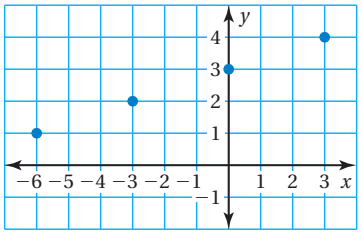
Because the line crosses the y-axis at $(0, -1)$, the y-intercept is -1.

∴ So, the linear function is $y = 2x - 1$.

Exercises

Use the graph or table to write a linear function that relates y to x.

5.



6.

x	−2	0	2	4
y	−7	−7	−7	−7

5.4 Function Notation *(pp. 224–235)*

Evaluate $f(x) = 3x - 20$ when $x = 4$.

$f(x) = 3x - 20$ Write the function.

$f(4) = 3(4) - 20$ Substitute 4 for x.

$= -8$ Simplify.

Exercises

Evaluate the function when $x = -5$, 0, and 2.

7. $f(x) = 5x + 12$ **8.** $g(x) = -1.5x - 1$ **9.** $h(x) = 7 - 3x$

10. Compare the graph of $f(x) = -3x - 1$ to the graph of $g(x) = -3x$.

11. Compare the graph of $y = |x| + 1$ to the graph of $y = |x|$.

5.5 Comparing Linear and Nonlinear Functions *(pp. 236–241)*

Does the table represent a *linear* or *nonlinear* function? Explain.

a.

		+2	+2	+2
x	0	2	4	6
y	0	1	4	9
		+1	+3	+5

As x increases by 2, y increases by different amounts. The rate of change is *not* constant. So, the function is nonlinear.

b.

		+5	+5	+5
x	0	5	10	15
y	50	40	30	20
		−10	−10	−10

As x increases by 5, y decreases by 10. The rate of change is constant. So, the function is linear.

Exercises

Does the table represent a *linear* or *nonlinear* function? Explain.

12.

x	3	6	9	12
y	1	10	19	28

13.

x	1	3	5	7
y	3	1	1	3

5.6 Arithmetic Sequences *(pp. 242–249)*

Write an equation for the *n*th term of the arithmetic sequence −3, −5, −7, −9, ... Then find a_{20}.

The first term is −3 and the common difference is −2.

$a_n = a_1 + (n - 1)d$ Equation for an arithmetic sequence

$a_n = -3 + (n - 1)(-2)$ Substitute −3 for a_1 and −2 for d.

$a_n = -2n - 1$ Simplify.

Use the equation to find the 20th term.

$a_{20} = -2(20) - 1$ Substitute 20 for n.

$= -41$ Simplify.

Exercises

Write an equation for the *n*th term of the arithmetic sequence. Then find a_{30}.

14. 11, 10, 9, 8, . . .

15. 6, 12, 18, 24, . . .

16. −9, −7, −5, −3, . . .