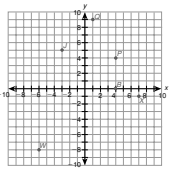
LESSON 1-8 Practice A

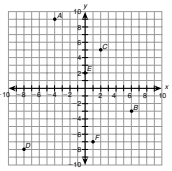
Introduction to Functions

Graph each point.



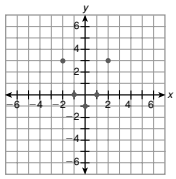
1. $P(4, 4)$
2. $Q(1, 9)$
3. $X(7, -1)$
4. $J(-3, 5)$
5. $W(-6, -8)$
6. $B(4, 0)$

Name the quadrant in which each point lies.



7. A Q II
8. B Q IV
9. C Q I
10. D Q III
11. E none
12. F Q IV

13. Generate ordered pairs for $y = x^2 - 1$ for $x = -2, -1, 0, 1$, and 2. Graph the ordered pairs and describe the pattern.



Input	Output	Ordered Pair
x	y	(x, y)
-2	$y = (-2)^2 - 1 = 3$	$(-2, 3)$
-1	$y = (-1)^2 - 1 = 0$	$(-1, 0)$
0	$y = (0)^2 - 1 = -1$	$(0, -1)$
1	$y = (1)^2 - 1 = 0$	$(1, 0)$
2	$y = (2)^2 - 1 = 3$	$(2, 3)$

The points form a U-shape.

14. The Granger family would like to rent a pavilion at the state park. The cost to rent a pavilion is \$50 plus \$15 for each hour of use. Write a rule for the cost of renting a park pavilion. Write ordered pairs to represent the cost of renting a pavilion for 3, 4, 5, and 6 hours.

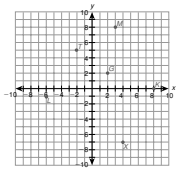
$y = 50 + 15x$; (3, 95), (4, 110), (5, 125), (6, 140)

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LESSON 1-8 Practice B

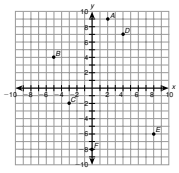
Introduction to Functions

Graph each point.



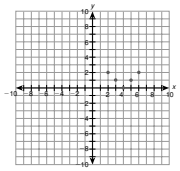
1. $G(2, 2)$
2. $M(3, 8)$
3. $X(4, -7)$
4. $L(-6, -1)$
5. $K(8, 0)$
6. $T(-2, 5)$

Name the quadrant in which each point lies.



7. A Q I
8. B Q II
9. C Q III
10. D Q I
11. E Q IV
12. F none

13. Generate ordered pairs for $y = |x - 4|$ using $x = 2, 3, 4, 5$ and 6. Graph the ordered pairs and describe the pattern.



Input	Output	Ordered Pair
x	y	(x, y)
2	$y = \|2 - 4\| = 2$	(2, 2)
3	$y = \|3 - 4\| = 1$	(3, 1)
4	$y = \|4 - 4\| = 0$	(4, 0)
5	$y = \|5 - 4\| = 1$	(5, 1)
6	$y = \|6 - 4\| = 2$	(6, 2)

The points form a V-shape.

14. The number of chaperones at a school field trip must be $\frac{1}{5}$ the number of students attending, plus the 2 teacher sponsors. Write a rule for the number of chaperones that must be on the trip. Write ordered pairs to represent the number of chaperones that must attend the trip when there are 120, 150, 200, and 210 students.

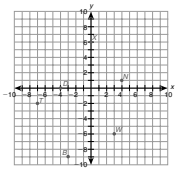
$y = \frac{1}{5}x + 2$; (120, 26), (150, 32), (200, 42), (210, 44)

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LESSON 1-8 Practice C

Introduction to Functions

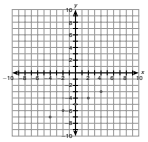
Graph each point. Then name the quadrant in which each point lies.



1. $B(-3, -9)$ Q III
2. $N(4, 1)$ Q I
3. $W(3, -6)$ Q IV
4. $X(0, 6)$ none
5. $T(-7, -2)$ Q III
6. $D(-4, 0)$ none

Generate five ordered pairs for each function. Graph the ordered pairs and describe the pattern.

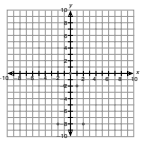
7. $y = \frac{1}{2}x - 5$



Possible answer: (−4, −7), (−2, −6), (0, −5), (2, −4), (4, −3)

The points form a straight line.

8. $y = -2x^2$



Possible answer: (−2, −8), (−1, −2), (0, 0), (1, −2), (2, −8)

The points form an upside down U-shape.

Write an equation for each rule. Use the given values for x to generate ordered pairs.

9. y is the sum of 1 and the product of -4 and x; $x = -5, -3, -1, 1, 3$ and 5

$y = -4x + 1$; (−5, 21), (−3, 13), (−1, 5), (1, −3,), (3, −11), (5, −19)

10. y is the quotient of the square of x and 3; $x = -6, -3, 0, 3$, and 6

$y = \frac{x^2}{3}$; (−6, 12), (−3, 3), (0, 0), (3, 3), (6, 12)

11. A long-distance phone call costs \$0.12 to connect and \$0.05 for each minute. Write a rule for the cost of a call. Write ordered pairs to represent the cost of a call that lasts 8, 15, 20, and 27 minutes.

$y = 0.12 + 0.05x$; (8, 0.52), (15, 0.87), (20, 1.12), (27, 1.47)

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LESSON 1-8 Reteach

Introduction to Functions

An ordered pair of numbers indicates where a point is on a coordinate plane. When graphing a point, the signs of the numbers indicate which directions to move along the x- and y-axes, starting from the origin.

Move **right** if positive. Move **left** if negative. — (x, y) — Move **up** if positive. Move **down** if negative.

Tell how to graph each point.

$(3, -5)$ Move 3 right on the x-axis and 5 down on the y-axis.

$(-4, 2)$ Move 4 left on the x-axis and 2 up on the y-axis.

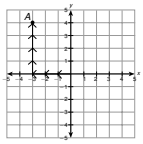
Graph $A(-3, 4)$.

Start at the origin (0, 0).

Move 3 spaces to the left.

Move 4 spaces up.

Plot the point.



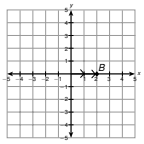
Graph $B(2, 0)$.

Start at the origin (0, 0).

Move 2 spaces to the right.

Move 0 spaces up or down.

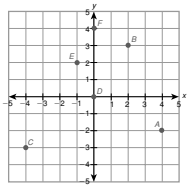
Plot the point.



Tell how to graph each point.

1. (5, 8) move 5 right on the x-axis and 8 up on the y-axis
2. $(-2, 9)$ move 2 left on the x-axis and 9 up on the y-axis
3. $(-6, -1)$ move 6 left on the x-axis and 1 down on the y-axis

Graph each point.



4. $A(4, -2)$
5. $B(2, 3)$
6. $C(-4, -3)$
7. $D(0, 0)$
8. $E(-1, 2)$
9. $F(0, 4)$

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LESSON 1-8

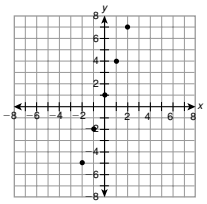
Reteach

Introduction to Functions continued

You can graph a function by generating ordered pairs.

Generate ordered pairs for $y = 3x + 1$ using $x = -2, -1, 0, 1,$ and 2. Graph the ordered pairs and describe the pattern.

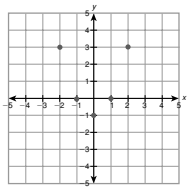
Input	Output	Ordered Pair
x	y	(x, y)
-2	$3(-2) + 1$ $-6 + 1$ -5	$(-2, -5)$
-1	$3(-1) + 1$ $-3 + 1$ -2	$(-1, -2)$
0	$3(0) + 1$ $0 + 1$ 1	$(0, 1)$
1	$3(1) + 1$ $3 + 1$ 4	$(1, 4)$
2	$3(2) + 1$ $6 + 1$ 7	$(2, 7)$



The points form a straight line.

10. Generate ordered pairs for $y = x^2 - 1$ using $x = -2, -1, 0, 1,$ and 2. Graph the ordered pairs and describe the pattern.

Input	Output	Ordered Pair
x	y	(x, y)
-2	$(-2)^2 - 1$ $4 - 1$ 3	$(-2, 3)$
-1	$(-1)^2 - 1$ $1 - 1$ 0	$(-1, 0)$
0	$(0)^2 - 1$ $0 - 1$ -1	$(0, -1)$
1	$(1)^2 - 1$ $1 - 1$ 0	$(1, 0)$
2	$(2)^2 - 1$ $4 - 1$ 3	$(2, 3)$



The points form a U-shape.

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LESSON 1-8

Challenge

Profit and Loss

Brandi decides to make and sell rag dolls. Her set up costs are $150 for a new sewing machine and patterns. The fabric costs $5 for each doll.

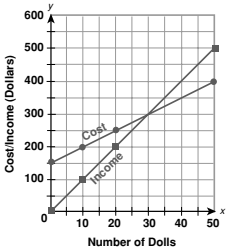
1. Write a rule for Brandi's cost of making dolls. Let y represent cost and x represent the number of dolls.

$y = 150 + 5x$

2. Find and graph ordered pairs for Brandi's cost of making 0, 10, 20, and 50 dolls. Describe the pattern, and then draw a line or curve that shows the pattern. Label it *Cost*.

(0, 150), (10, 200), (20, 250), (50, 400);

the points form a straight line.



Brandi makes an income of $10 for each doll she sells.

3. Write a rule for Brandi's income. Let y represent income and x represent the number of dolls.

$y = 10x$

4. Find and graph ordered pairs for Brandi's income from selling dolls. Describe the pattern, and then draw a line or curve that shows the pattern. Label it *Income*.

sample ordered pairs: (0, 0), (10, 100), (20, 200),

(50, 500); the points form a straight line.

Use your graph to answer Exercises 6–10.

5. A business has a *profit* when its income is greater than its costs. From the graph, how do you know when Brandi has a profit?

when the line for income is above the line for cost

6. A business has a *loss* when its costs are greater than its income. From the graph, how do you know when Brandi has a loss?

when the line for income is below the line for cost

7. If Brandi only makes and sells 10 dolls, does she have a profit or a loss? How much profit or loss?

a loss of $100

8. If Brandi makes and sells 40 dolls, does she have a profit or a loss? How much profit or loss?

a profit of $50

9. A business *breaks even* when its costs equals its income. How many dolls would Brandi need to make and sell to break even?

30 dolls

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LESSON 1-8

Problem Solving

Introduction to Functions

Write the correct answer.

1. The number of teachers at a university is $\frac{1}{15}$ the number of students. Write a rule for the number of teachers at the university.

$y = \frac{1}{15}x$

2. Use the rule in problem 1 to write ordered pairs for the number of teachers when there are 1230, 1500, 3045, and 4515 students.

(1230, 82), (1500, 100)

(3045, 203), (4515, 301)

3. The starting salary for a new teacher in a certain school district is $29,000 plus $2100 for each year of previous teaching experience. Write a rule for the starting salary of a teacher in this school district.

$y = 29{,}000 + 2100x$

4. Use the rule in problem 3 to write ordered pairs for the starting salaries of teachers with 0, 3, 5, and 10 years of teaching experience.

(0, 29,000), (3, 35,300)

(5, 39,500), (10, 50,000)

A class officer will buy picture frames as favors for the prom. To ensure she has enough frames, she plans to buy frames for the 18 teacher chaperones plus 1.2 times the number of students who buy tickets to the prom. Select the best answer.

5. Which rule represents the number of frames the class officer will buy?

A $y = 19.2 + x$
B $y = 19.2x$
C $y = 18x + 1.2$
(D) $y = 18 + 1.2x$

6. How many picture frames will the class officer buy if 225 students buy tickets to the prom?

F 244 **H** 270
G 252 **(J)** 288

7. Since both the number of students who buy tickets and the number of frames the class officer will buy cannot be negative, which quadrant will the ordered pairs that satisfy the rule in problem 5 lie in?

(A) Quadrant I **C** Quadrant III
B Quadrant II **D** Quadrant IV

8. If the class officer generates and graphs ordered pairs for the rule in problem 5, which statement would be true?

(F) The points would form a line.
G The points would form a U-shape.
H The points would form a V-shape.
J There will be no pattern.

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LESSON 1-8

Reading Strategies

Follow a Procedure

The steps to graphing a function are detailed in the procedure below. The example that follows shows this procedure.

Step 1: Create a table with 3 columns titled "x", "y", and "(x, y)."
Step 2: Choose appropriate x-values or list those that are given.
Step 3: Substitute x-values into the function and evaluate for y.
Step 4: Write corresponding x- and y-values as ordered pairs.
Step 5: Plot the ordered pairs on a coordinate plane.

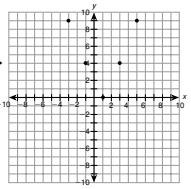
Graph the function $y = 2|x - 1|$ for $x = -3, -1, 1, 3, 5$.

Step 1 →

x	y	(x, y)
-3	$2\|-3 - 1\| = 8$	$(-3, 8)$
-1	$2\|-1 - 1\| = 4$	$(-1, 4)$
1	$2\|1 - 1\| = 0$	$(1, 0)$
3	$2\|3 - 1\| = 4$	$(3, 4)$
5	$2\|5 - 1\| = 8$	$(5, 8)$

Step 2 Step 3 Step 4

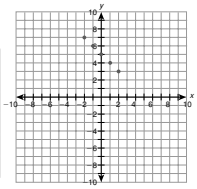
→ Step 5



Use the procedure shown above to graph each function for the given values of x.

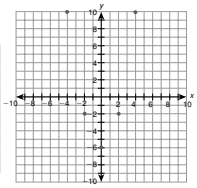
1. $y = -x + 5$ for $x = -2, -1, 0, 1, 2$

x	y	(x, y)
-2	$-(-2) + 5 = 7$	$(-2, 7)$
-1	$-(-1) + 5 = 6$	$(-1, 6)$
0	$-0 + 5 = 5$	$(0, 5)$
1	$-1 + 5 = 4$	$(1, 4)$
2	$-2 + 5 = 3$	$(2, 3)$



2. $y = x^2 - 6$ for $x = -4, -2, 0, 2, 4$

x	y	(x, y)
-4	$(-4)^2 - 6 = 10$	$(-4, 10)$
-2	$(-2)^2 - 6 = -2$	$(-2, -2)$
0	$0^2 - 6 = -6$	$(0, -6)$
2	$2^2 - 6 = -2$	$(2, -2)$
4	$4^2 - 6 = 10$	$(4, 10)$



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