CRAVEN
COMMUNITY COLLEGE

TABE

MATH - D

Unit - 1

Lesson - 5

X-Y Ordered Pairs

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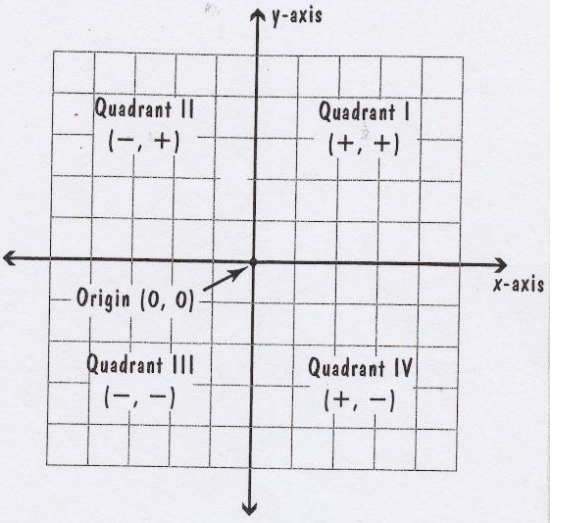
Lesson 5 Ordered Pair Relationships

6.NS.6.b – Medium, 6.NS.6.c – Medium

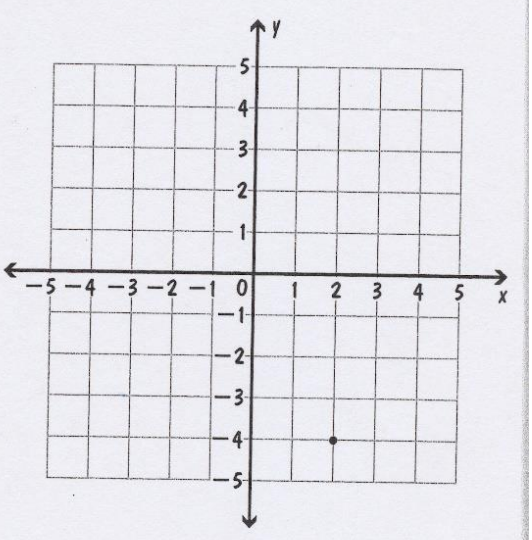
The axes of a coordinate plane divide the coordinate plane into four **quadrants**. The point where the axes intersect is called the **origin**. The horizontal axis is the ***x*-axis**, and the vertical axis is the ***y*-axis**. The numbers in an ordered pair are called **coordinates**. The first number is called the ***x*-coordinate**, and the second one is the ***y*-coordinate**.



To graph the ordered pair (x, y) from the origin, move right (+) or left (−) the number of units indicated by the x-value. Then from that location move up (+) or down (−) the number of units indicated by the y-value.

Points can be reflected across an axis. Points with opposite x-values but the same y-values are reflected across the y-axis. Points with opposite y-values but the same x-values are reflected across the x-axis.

Example **Identify the coordinates and quadrant of the point. Identify the coordinates of the point reflected across the *x*-axis.**



1) Determine the x-coordinate. Follow the vertical line drawn through the point until it intersects the x-axis. In this case the point has an x-coordinate value of 2.

2) Determine the y-coordinate. Follow the horizontal line drawn through the point until it intersects the y-axis. In this case the point has a y-coordinate value of −4.

3) Determine the coordinate values of the point reflected across the x-axis. A point reflected across the x-axis has the same x-value but an opposite y-value.

The coordinates of the point are (2, −4). The coordinates of the point reflected across the x-axis are (2, 4).

Test Example

1. In which quadrant is $(2, -\frac{1}{2})$?

   A. Quadrant I
   B. Quadrant II
   C. Quadrant III
   D. Quadrant IV

1. **D** The point $(2, -\frac{1}{2})$ lies below the x-axis and to the right of the y-axis, so it is located in Quadrant IV.

Strategy

Sketch a coordinate plane and plot the point.

Practice

Read each question. Select the correct answer.

1 Which sign description is correct for a point in Quadrant III?

A. (+,+)
B. (+,−)
C. (−,−)
D. (−,+)

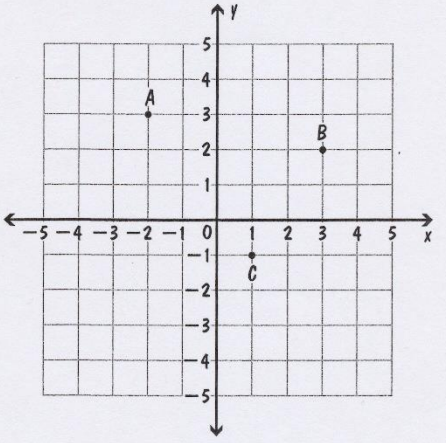
2 The point (−2.875, −200) is in Quadrant III. What kind of reflection would move the point to Quadrant IV?

A. a reflection across the x-axis
B. a reflection across the y-axis
C. a reflection across the x-axis and then a reflection across the y-axis
D. a reflection across the y-axis and then a reflection across the x-axis

3 Point D (3, −7) is reflected across the x-axis to Point E. Point E is reflected across the y-axis to Point F. What are the coordinates of Point F?

A. (3, 7)
B. (−3, −7)
C. (3, −7)
D. (−3, 7)

Use the graph to answer questions 4–6.



4 Identify the coordinates of Point A.

A. (2, 3)
B. (−2, −3)
C. (−2, 3)
D. (2, −3)

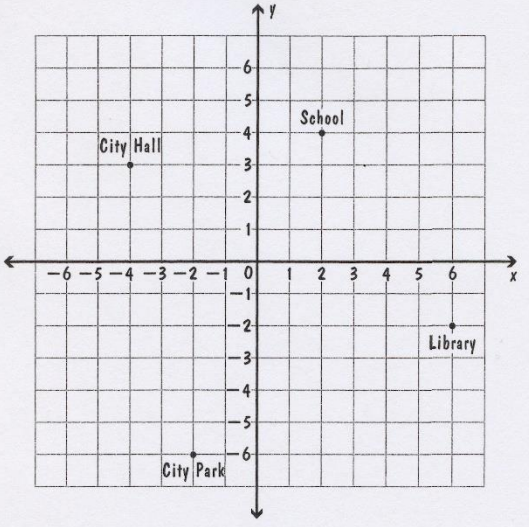
5 Identify the coordinates of Point B.

A. (3, 2)
B. (−3, −2)
C. (−3, 2)
D. (3, −2)

6 Identify the coordinates of Point C.

A. (1, 1)
B. (−1, −1)
C. (−1, 1)
D. (1, −1)

Use the graph to answer questions 7 and 8.



7 Where is City Hall located on the coordinate plane?

A. (4, 3)

B. (4, −3)

C. (−4, −3)

D. (−4, 3)

8 Where is the Library located on the coordinate plane?

A. (6, 2)

B. (6, −2)

C. (−6, −2)

D. (−6, 2)

9 Tim's house is located at point (8, −11) on a coordinate plane. Kelly's house is a reflection of Tim's house across the y-axis. What are the coordinates of Kelly's house?

A. (8, 11)

B. (−8, −11)

C. (−8, 11)

D. (8, −11)

10 The point (−15, 22) is in Quadrant II. What kind of reflection would move the point to Quadrant IV?

A. a reflection across the x-axis

B. a reflection across the y-axis

C. a reflection across the x-axis and then a reflection across the y-axis

D. a reflection across the y-axis and then another reflection across the y-axis

11 In which quadrant is $(-3, -\frac{2}{5})$?

A. Quadrant I

B. Quadrant II

C. Quadrant III

D. Quadrant IV

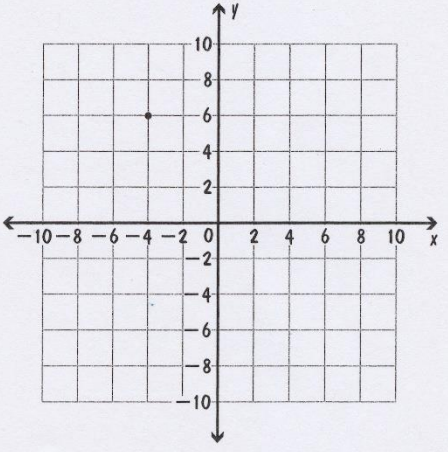
12 Identify the coordinates of the point.

A. (4, 6)

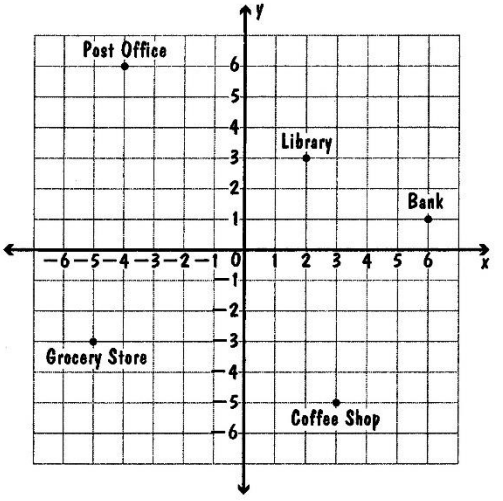
B. (–4, –6)

C. (–4, 6)

D. (4, –6)



Use the graph for items 12–16.



12 Where is the grocery store located on the coordinate plane?

A. (5, 3) B. (5, −3)

C. (−5, 3) D. (−5, −3)

13 Where is the coffee shop located on the coordinate plane?

A. (3, 5) B. (3, −5)

C. (−3, 5) D. (−3, −5)

14 Where is the bank located on the coordinate plane?

A. (6, 1) B. (6, −1)

C. (−6, 1) D. (−6, −1)

15 Where is the post office located on the coordinate plane?

A. (4, 6) B. (4, −6)

C. (−4, 6) D. (−4, −6)

16 Where is the library located on the coordinate plane?

A. (−2, −3) B. (2, 3)

C. (−2, 3) D. (2, −3)

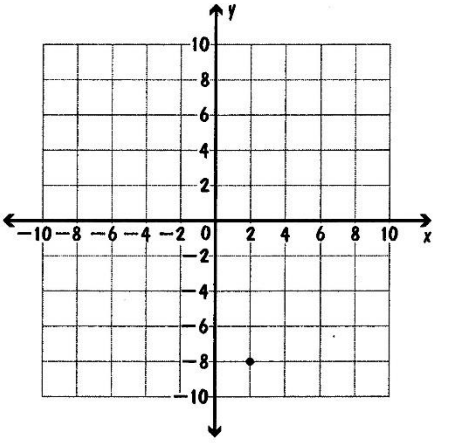
17 A football stadium is located at point (−7, −15) on a coordinate plane. A baseball stadium is a reflection of the football stadium across the x-axis. What are the coordinates of the baseball stadium?

A. (7, 15) B. (7, −15)

C. (−7, 15) D. (−7, −15)

18 Part A

Identify the coordinates of the point on the coordinate plane.



A. (2, 8) B. (2, −8)

C. (−2, 8) D. (−2, −8)

Part B

If the point from Part A is reflected across the x-axis, what will be its coordinates?

A. (2, 8) B. (2, −8)

C. (−2, 8) D. (−2, −8)

19 The point (4, 4) is in Quadrant I. Which of these would move the point to Quadrant III?

A. a reflection across the x-axis

B. a reflection across the y-axis

C. a reflection across the x-axis and then a reflection across the y-axis

D. a reflection across the y-axis, a reflection across the x-axis, and then a reflection across the y-axis

Math-D Lesson-5 Key

Lesson 5 Ordered Pair Relationships

(6.NS.6.b, 6.NS.6.c)

1. **C.** Quadrant III is to the left of the y-axis ($-x$) and below the x-axis ($-y$).
2. **B.** Quadrant III and Quadrant IV have opposite y-values, so a reflection across the y-axis would move a point from Quadrant III to Quadrant IV.
3. **D.** A reflection across an axis changes the sign of the corresponding coordinate value. Since F is a reflection of D across both the x- and y-axes, the coordinates of Point F have the opposite x- and y-value as Point D.
4. **C.** Point A is located in Quadrant II, so it has a negative x-value and a positive y-value.
5. **A.** Point B is located in Quadrant I, so its x- and y-values are both positive.
6. **D.** Point C is located in Quadrant IV, so it has a positive x-value and a negative y-value.
7. **D.** Count the number of units from the origin, the point at which the vertical and horizontal lines intersect. City Hall is located 4 units to the left (-4) and 3 units above (3) the origin.
8. **B.** Count the number of units from the origin, the point at which the vertical and horizontal lines intersect. The Library is located 6 units to the right (6) and 2 units below (-2) the origin.
9. **B.** A point reflected across the y-axis results in another point having the same y-value but opposite x-value.
10. **C.** Quadrant II contains points having ($-x$, y) values. Quadrant IV contains points having (x, $-y$) values. Since the points in Quadrant IV have opposite y- and x-values from points in Quadrant II, it would take a reflection across both axes to move the point.
11. **C.** Points in Quadrant III have negative x- and negative y-values.
12. **C.** Count the number of units from the origin, the point at which the vertical and horizontal lines intersect. The point is located 4 units to the left (-4) and 6 units above (6) the origin.

Math-D Practice-5 Key

Practice 5 Ordered Pair Relationships

pp. 10–11 (6.NS.6.b, 6.NS.6.c)

1. D. Points in Quadrant IV have a positive x-value and a negative y-value.
2. C. Quadrant II is to the left of the y-axis, so the x-values are negative. It is above the x-axis, so the y-values are positive.
3. B. A reflection across an axis changes the sign of the opposing coordinate value. Because Point N is a reflection of Point L across both the x- and y-axes, the coordinates of Point N have the opposite x- and y-values as Point L.
4. A. Quadrant IV and Quadrant I have opposite y-values, so a reflection across the x-axis would move a point from Quadrant IV to Quadrant I.
5. C. Quadrant III is to the left of the y-axis, so the x-values are negative. It is below the x-axis, so the y-values are negative.
6. D. Point A is located in Quadrant III, so its x- and y-values are both negative.
7. B. Point B is located in Quadrant IV, so it has a positive x-value and a negative y-value.
8. C. Point C is located in Quadrant II, so it has a negative x-value and a positive y-value.
9. A. Point D is located in Quadrant I, so its x- and y-values are both positive.
10. C. A reflection across an axis changes the sign of the opposing coordinate value. A reflection of point B would have the coordinates (4, 4) or (−4, −4).
11. D. A reflection across an axis changes the sign of the opposing coordinate value. A reflection of point C would have the coordinates (4, 2) or (−4, −2).
12. D. Count the number of units from the origin. The grocery store is located 5 units to the left (−5) and 3 units below (−3) the origin.
13. B. Count the number of units from the origin. The coffee shop is located 3 units to the right (3) and 5 units below (−5) the origin.
14. A. Count the number of units from the origin. The bank is located 6 units to the right (6) and 1 unit above (1) the origin.
15. C. Count the number of units from the origin. The post office is located 4 units to the left (−4) and 6 units above (6) the origin.
16. B. Count the number of units from the origin. The library is located 2 units to the right (2) and 3 units above (3) the origin.
17. C. A point reflected across the x-axis results in another point having the same x-value but the opposite y-value.
18. B. **Part A** Count the number of units from the origin. The point is located 2 units to the right (2) and 8 units below (−8) the origin.

    A. **Part B** A reflection across the x-axis changes the sign of the y-coordinate, so the coordinates of the reflected point will be (2, 8).
19. C. Quadrant I contains points having (x, y) values. Quadrant III contains points having $(-x, -y)$ values. Because the points in Quadrant III have opposite x- and y-values from points in Quadrant I, it would take a reflection across both axes to move the point.