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6th Grade

Graphing

2016-06-01

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Graphing 6th Grade Topics

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Teacher Notes

Graphing 6th Grade Topics

Click on the topic to go to that section

Vocabulary Words are bolded in the presentation. The text box the word is in is then linked to the page at the end of the presentation with the word defined on it.

Cartesian Plane

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Cartesian Plane History

The development of the Coordinate or Cartesian plane is often credited to the French philosopher and mathematician, Rene Descartes.

It is said that Descartes first came up with the idea for the **plane** as he lay in bed watching several flies crawl across his tiled ceiling; he observed their movement he realized that he could use the intersecting lines formed by the tiles to describe a fly's location.

Rene Descartes
1596 - 1650

Teacher Notes

Cartesian Plane History

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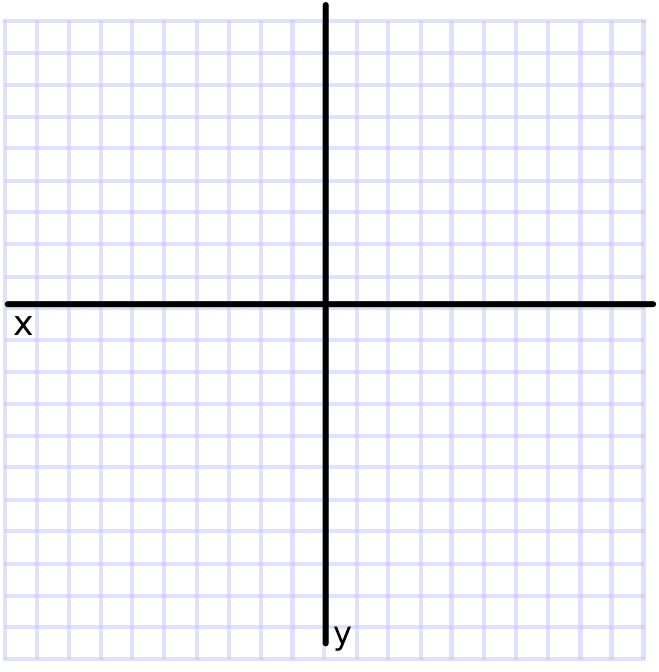
It is said that Descartes first came up with the idea for the **plane** as he lay in bed watching several flies crawl across his tiled ceiling; as he observed their movement he realized that he could use the intersecting lines formed by the tiles to describe a fly's location.

The well known quote; "Cogito,ergo sum" (I think, therefore I am) is attributed to Rene Descartes.

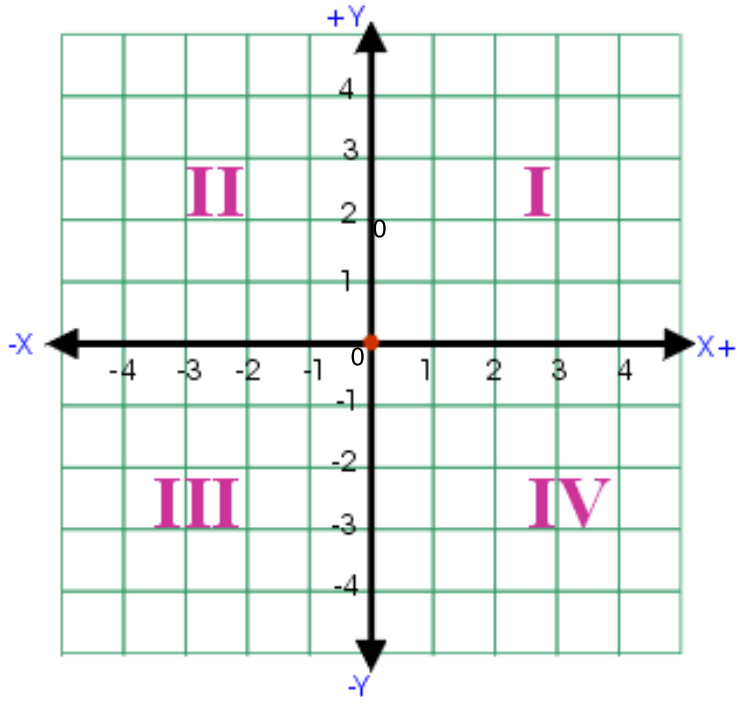
Rene Descartes
1596 - 1650

Cartesian Plane History

Although historical evidence suggests that a contemporary of Descartes, Pierre de Fermat, did more to develop the coordina system, Rene Descartes' work certainly revolutionized mathematics by describing the properties of the plane and usi as the first systematic link between Euclidean geometry and algebra.



Coordinate Plane

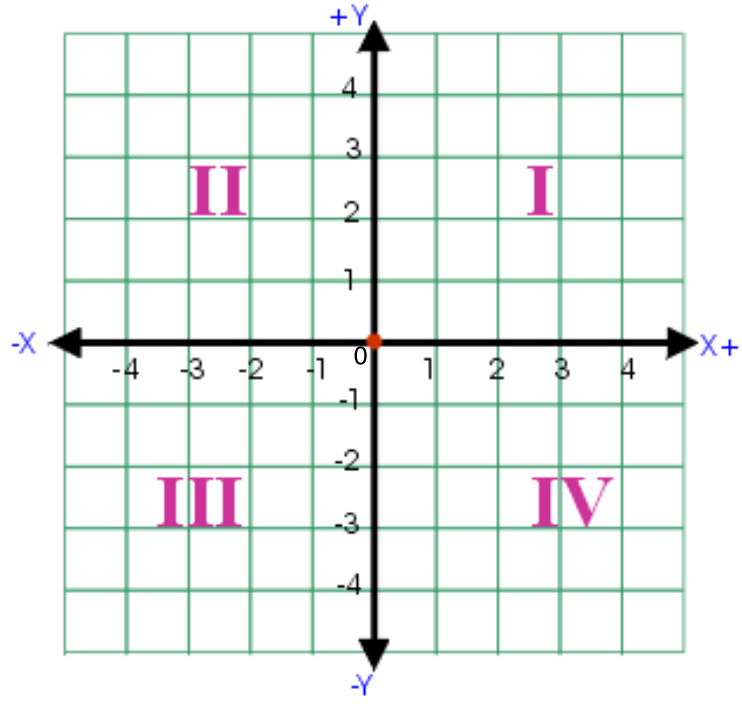


The coordinate plane is divided into four sections called **quadrants**.

Each quadrant is numbered using the Roman numerals I throu
IV, in a **counter-clockwise** direction.

Coordinate Plane

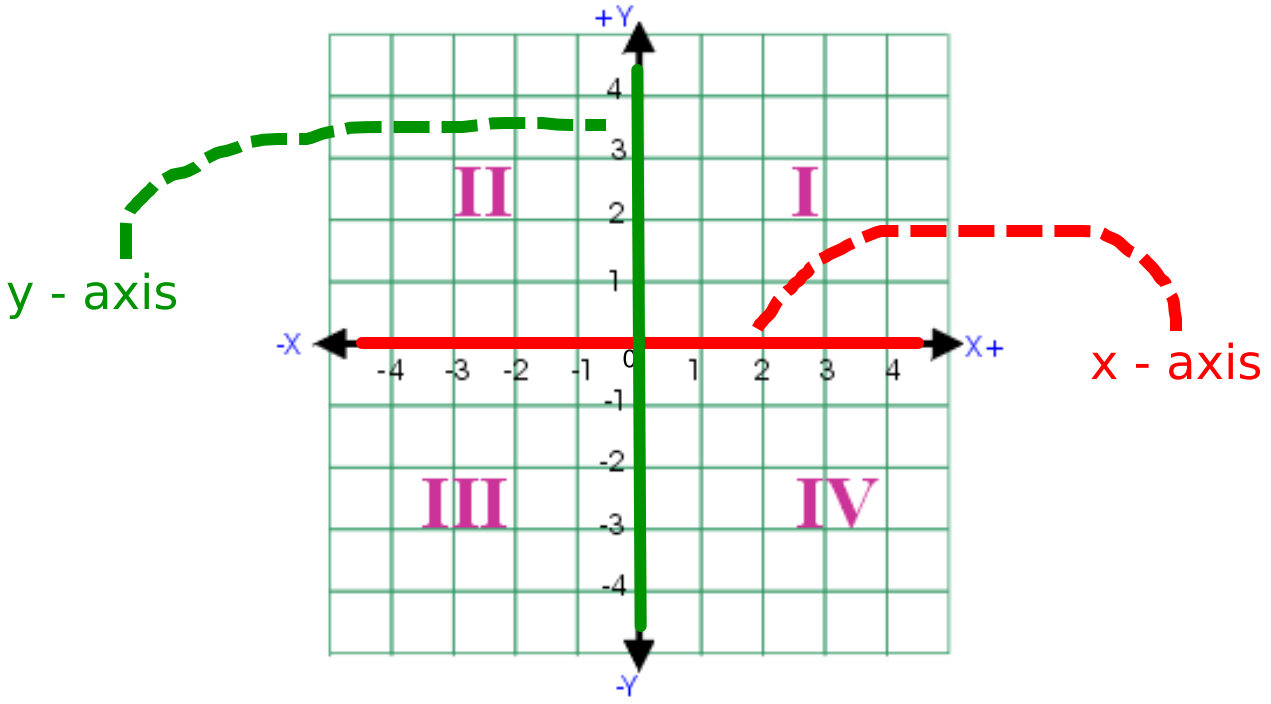
Slide the "C" onto the coordinate plane



The Coordinate plane is also called a **Cartesian plane**

One way to remember how the quadrants are numbered is write a big "C" on top of the plane. The "C" will begin in quadrant I and end in quadrant IV.

Coordinate Plane Axes

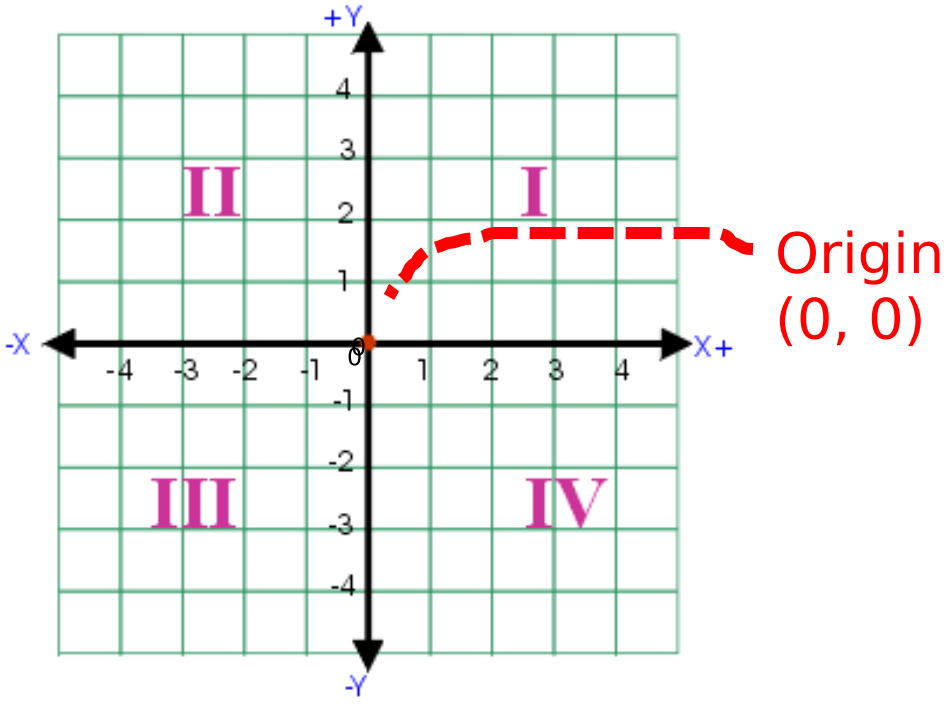


The quadrants are formed by two intersecting number lines called axes.

The horizontal line is the **x-axis**.

The vertical line is the **y-axis**.

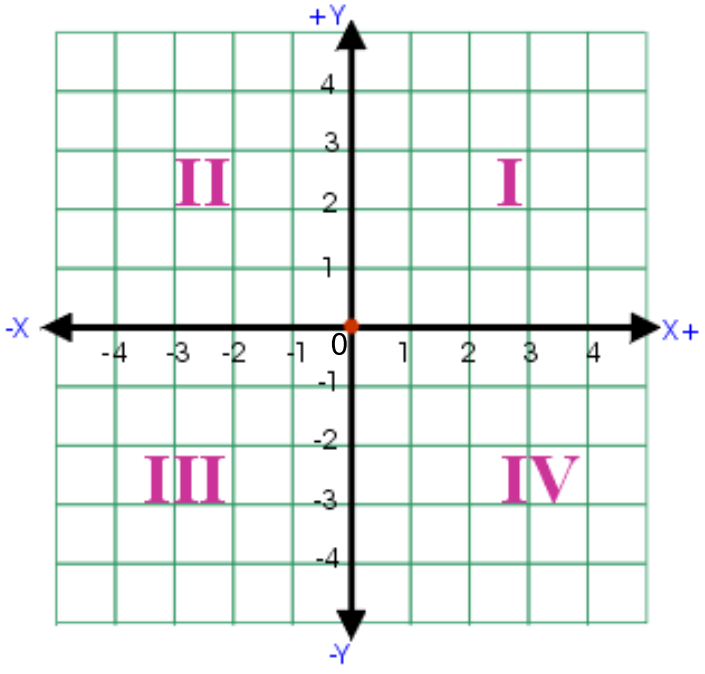
Coordinate Plane



The point at which the x and y axes intersect is called the **origin**.

The **coordinates** of the origin are (0, 0).

Ordered Pairs



Points can be plotted on the plane using one coordinate from each of the two axes.These sets are called **ordered pairs**. The x coordinate always appears first in these pairs. The y coordinate appears second.

(x, y)

Math Practice

Ordered Pairs

Math Practice

MP.6: Attend to precision

Emphasize the order of the x- and y-coordinates.

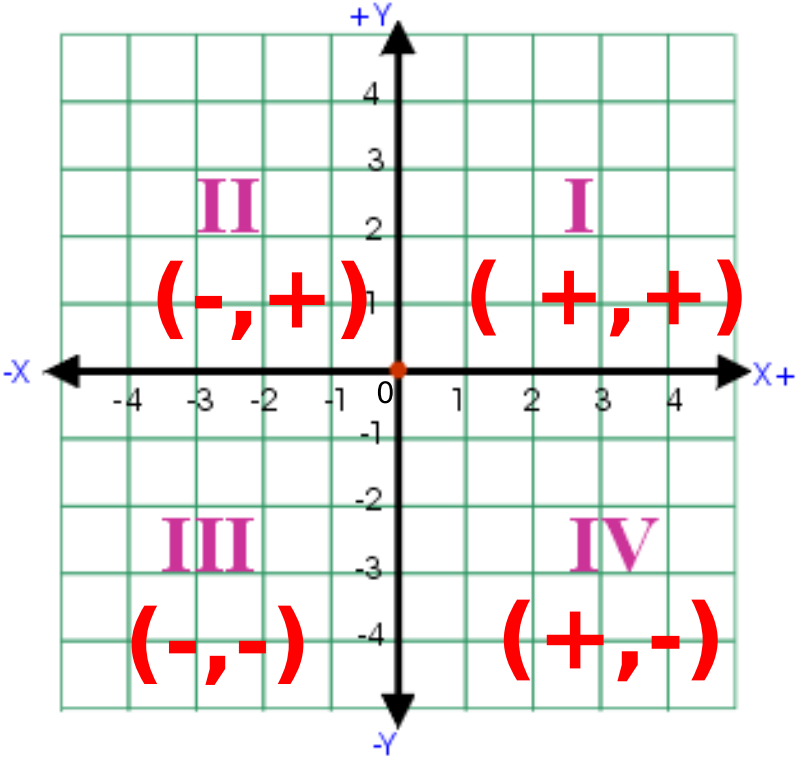
Ask: Which letter comes before the other in the alphabet? So, which number would come first in our ordered pair to make it accurate?

Points can be plotted on the plane using one coordinate from each of the axes.These sets are called **ordered pairs**. The x coordinate always appears first in these pairs. The y coordinate appears second.

(x, y)

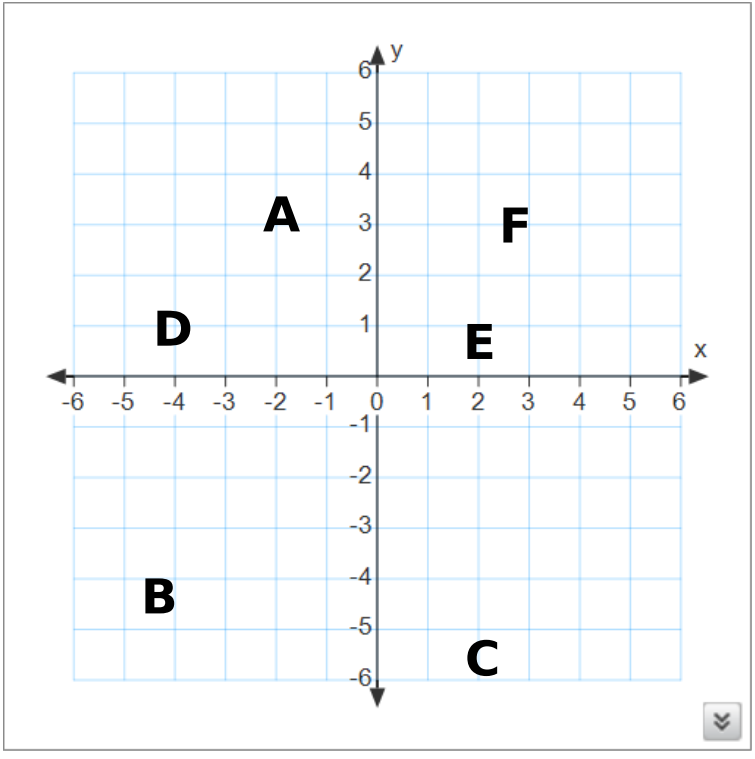
Coordinate Plane

Each of the quadrants can be identified by the properties of the numbers that fall within their plane. Remember ordered pairs are always of the form (x, y)



1 What points are in quadrant II ?

- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F



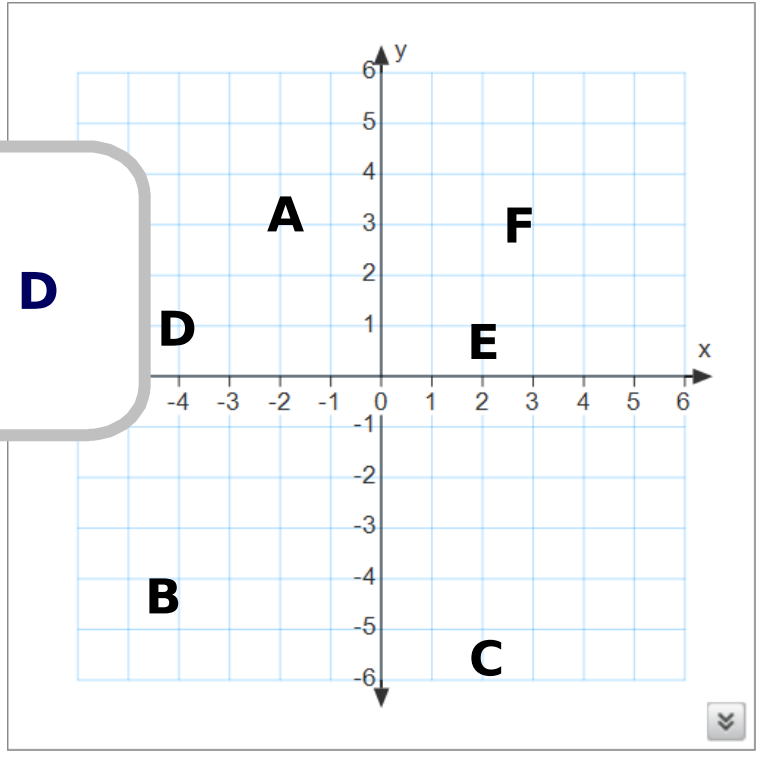
Answer

1 What points are in quadrant II ?

- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F

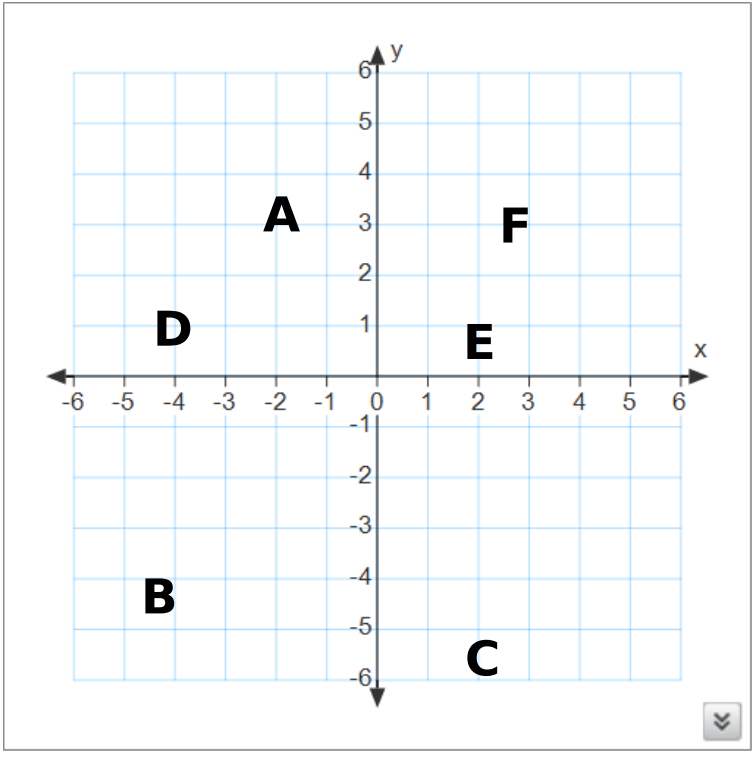
Answer

A & D



2 What points are in quadrant I ?

- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F



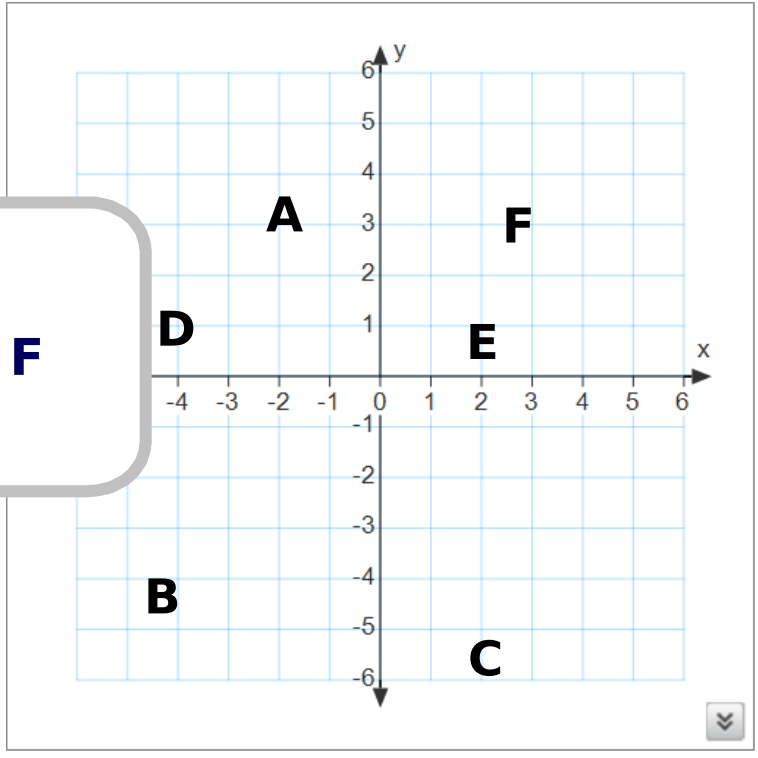
Answer

2 What points are in quadrant I ?

- ❑ A
- ❑ B
- ❑ C
- ❑ D
- ❑ E
- ❑ F

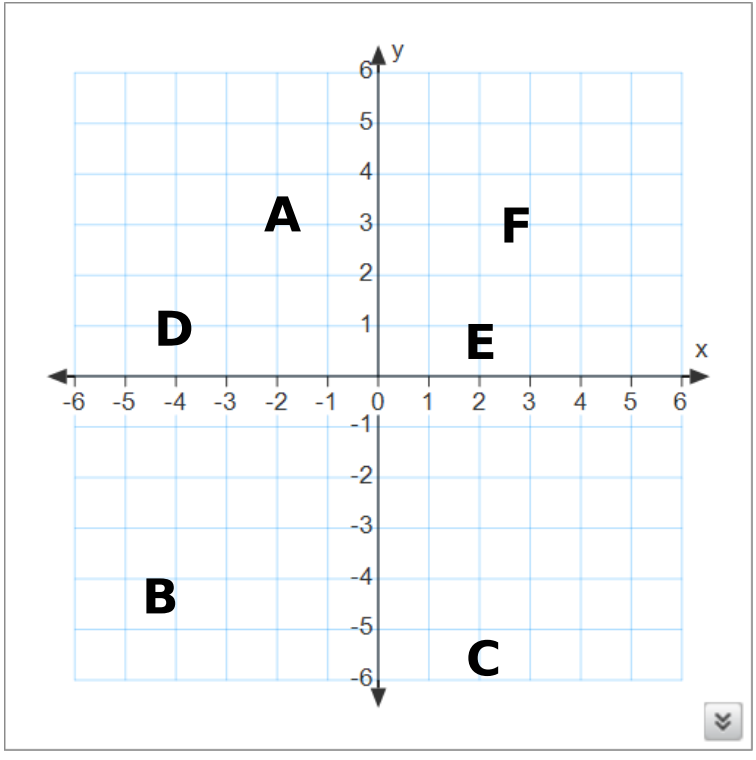
Answer

E & F



3 What points are in quadrant IV ?

- ❑ A
- ❑ B
- ❑ C
- ❑ D
- ❑ E
- ❑ F



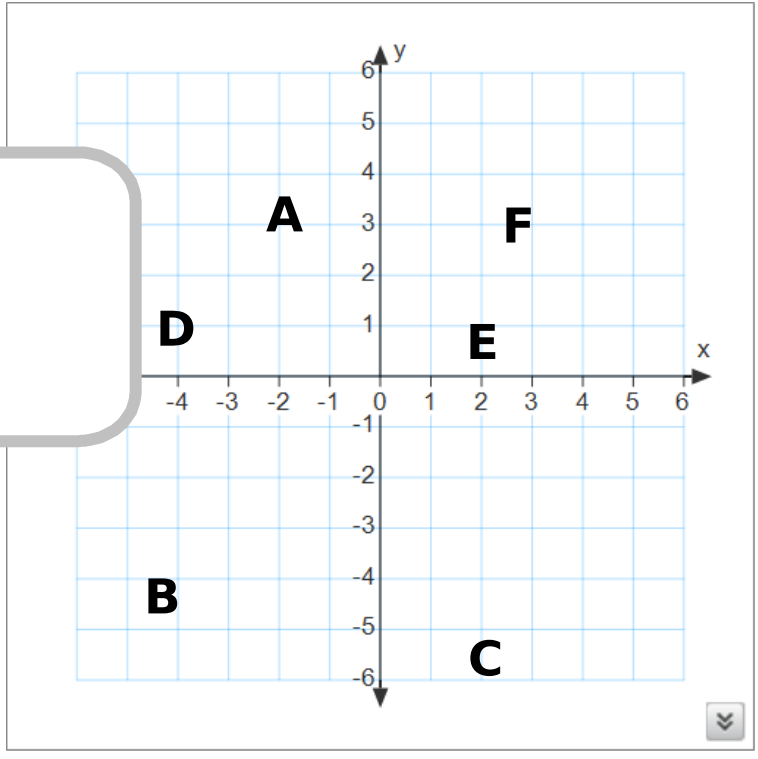
Answer

3 What points are in quadrant IV ?

- ❑ A
- ❑ B
- ❑ C
- ❑ D
- ❑ E
- ❑ F

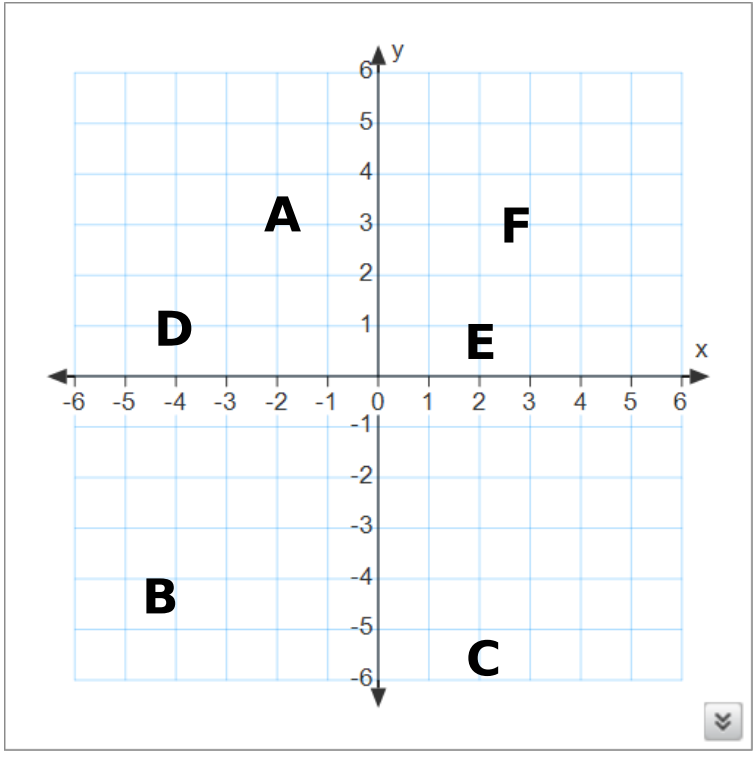
Answer

C



4 What points are in quadrant III ?

- ❑ A
- ❑ B
- ❑ C
- ❑ D
- ❑ E
- ❑ F



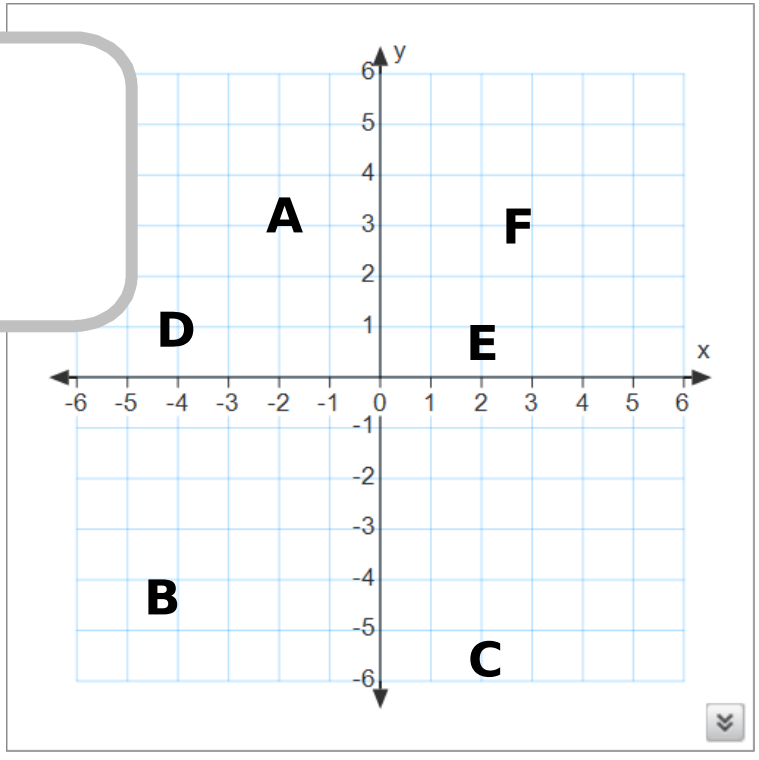
Answer

4 What points are in quadrant III ?

- ❑ A
- ❑ B
- ❑ C
- ❑ D
- ❑ E
- ❑ F

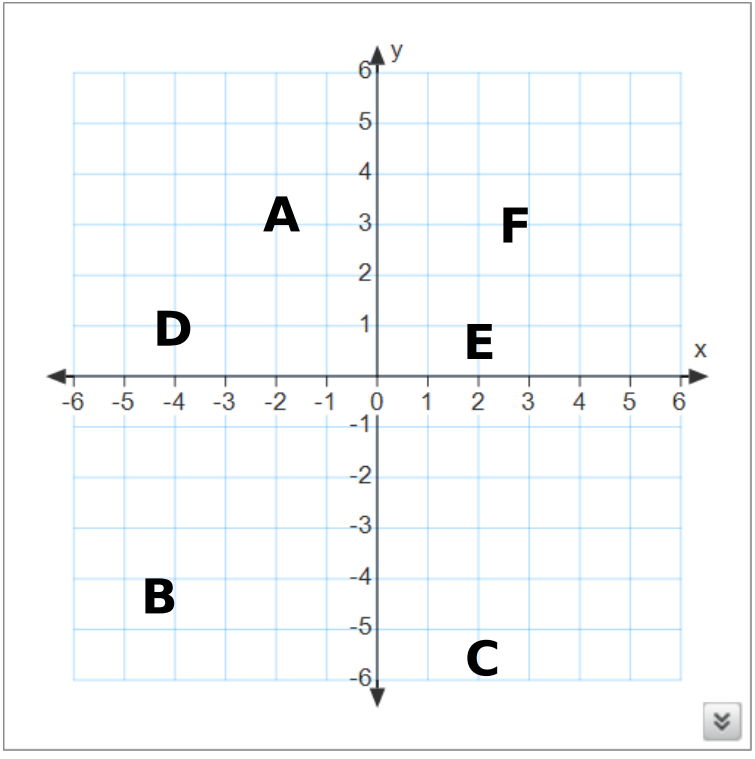
Answer

B



5 What point is closest to the origin?

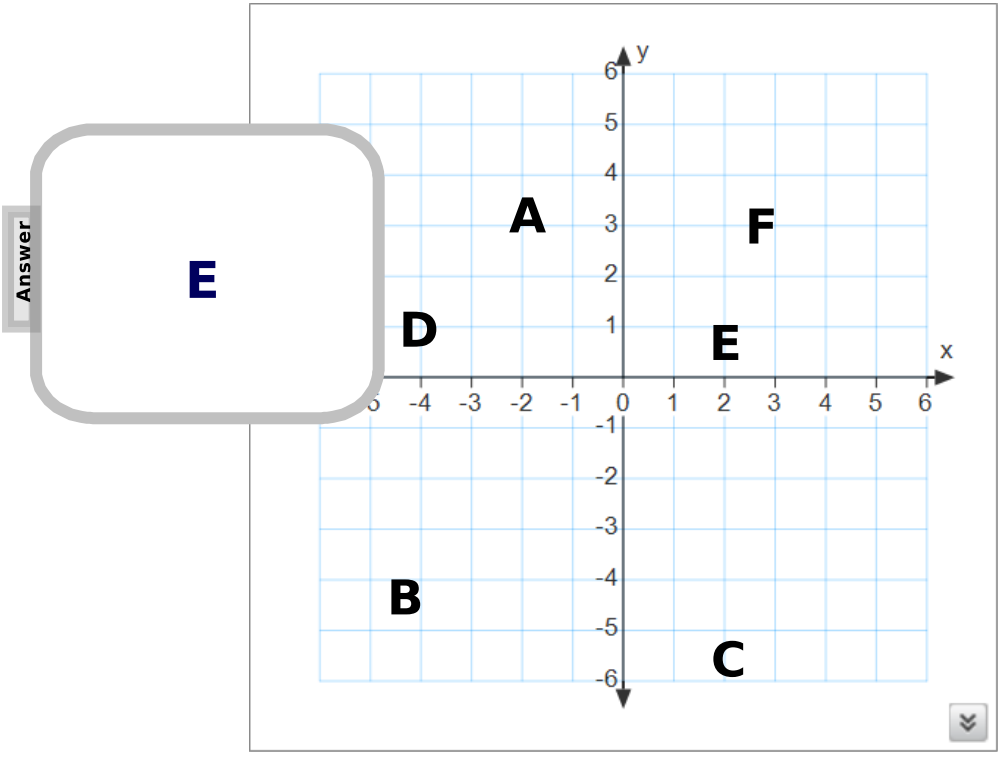
- ❑ A
- ❑ B
- ❑ C
- ❑ D
- ❑ E
- ❑ F



Answer

5 What point is closest to the origin?

- ❑ A
- ❑ B
- ❑ C
- ❑ D
- ❑ E
- ❑ F



Graphing Ordered Pairs

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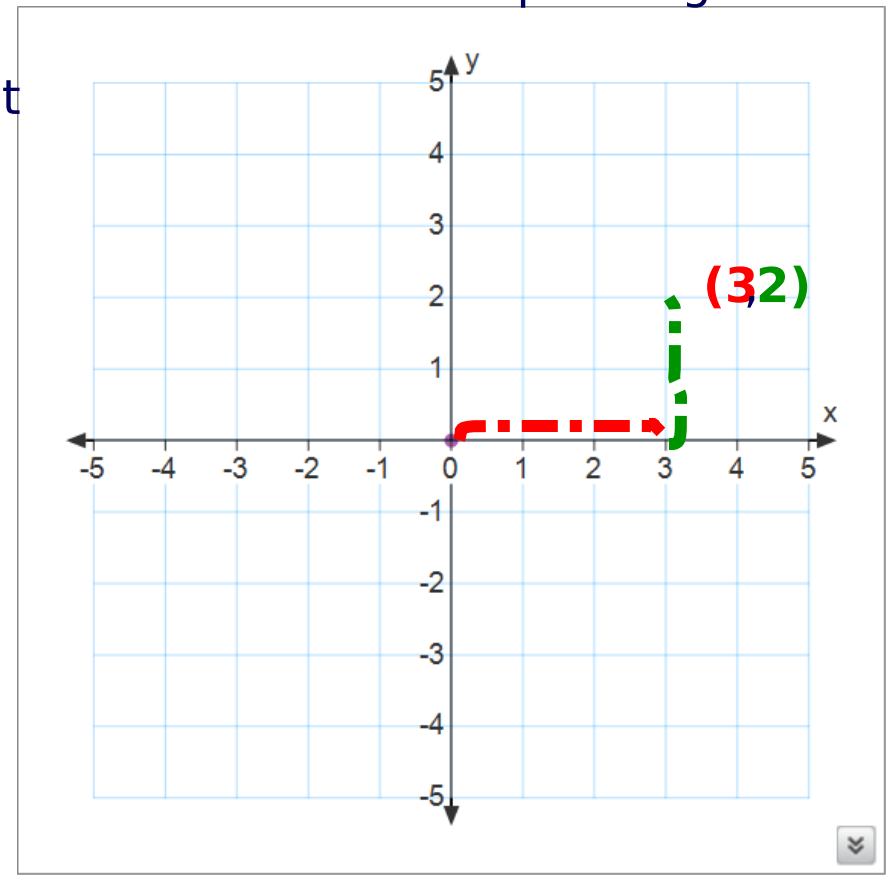
Ordered Pairs

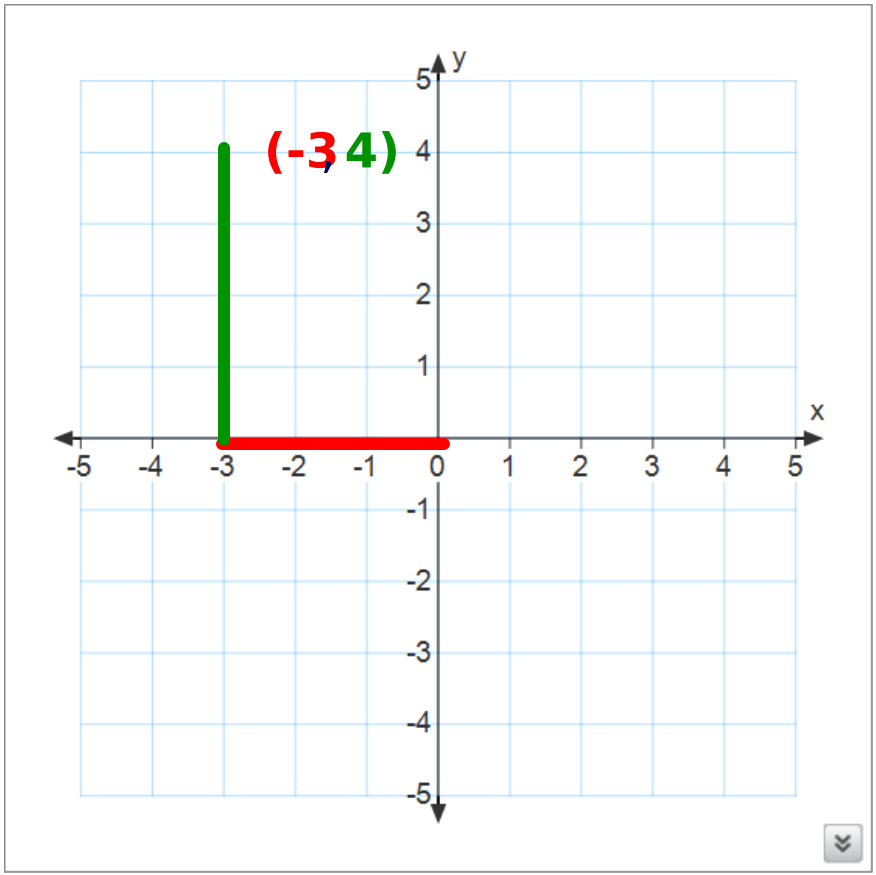
To graph an ordered pair, such as (3, 2):

- start at the origin (0, 0)
- move left or right on the x-axis depending on the first number
- then move up or down from there depending on the second number
- plot the point



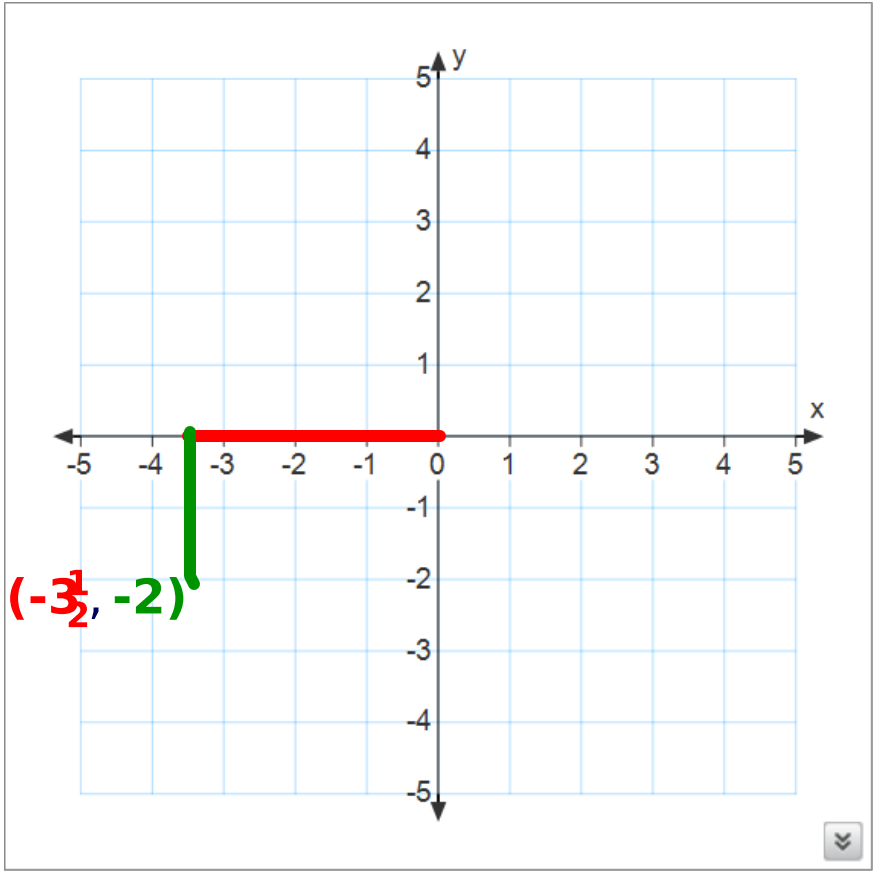
Ordered Pairs

To graph (-3, 4):
Start at the origin and then move
3 left, up 4



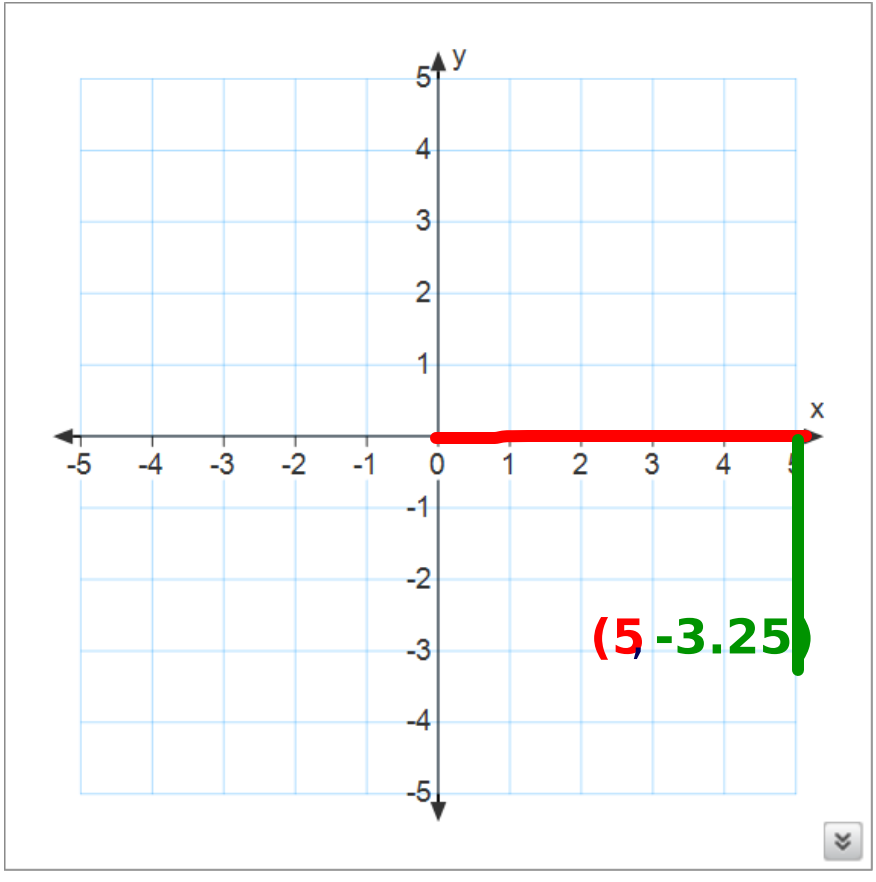
Ordered Pairs

To graph $(-3\frac{1}{2}, -2)$:
Start at the origin and then move
3 and a half left, down 2

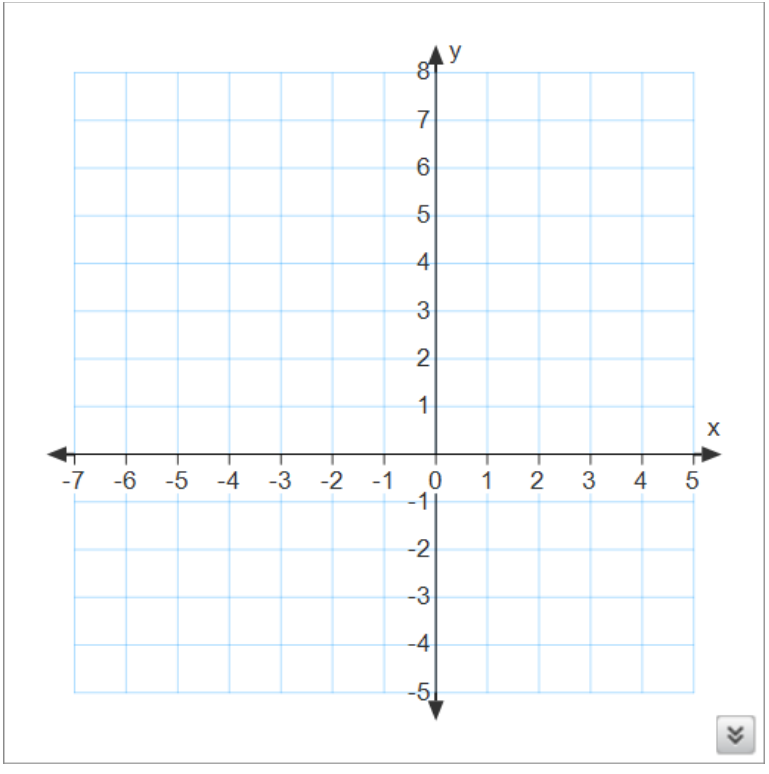


Ordered Pairs

To graph (5, -3.25)
Start at the origin and then move
5 right, down 3.25



Ordered Pairs Practice



Place the star on (2.5, 8) in quadrant I

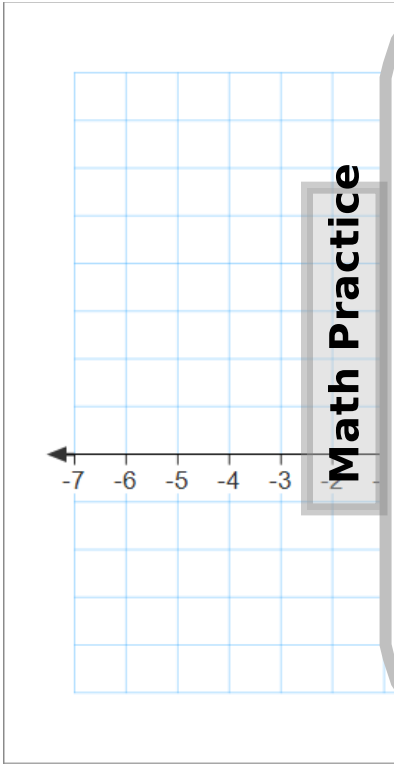
Place the triangle on (-4, 4) in quadrant II

Place the square on $(-7, -3\frac{1}{2})$ in quadrant III

Place the circle on (1, -4) in quadrant IV

Math Practice

Ordered Pairs Practice



Math Practice

MP.2: Reasoning abstractly and quantitatively.

Ask: What does the number _ represent in the problem?

Which way do I move on the graph based on that number?

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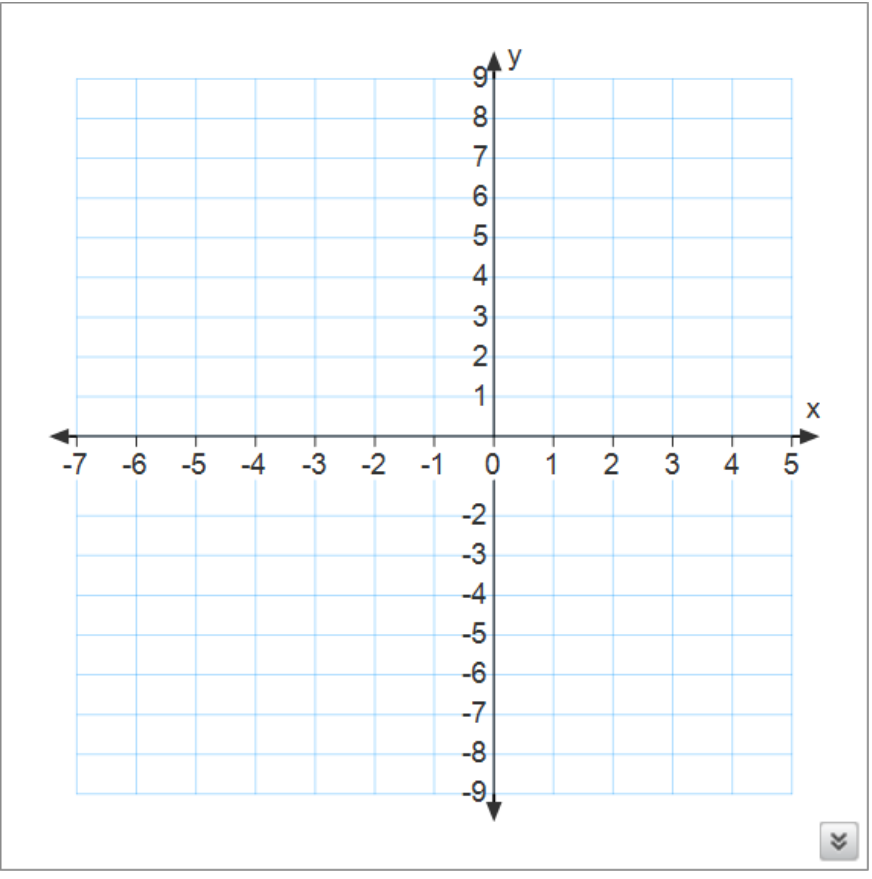
1, -4) in

Ordered Pairs Practice

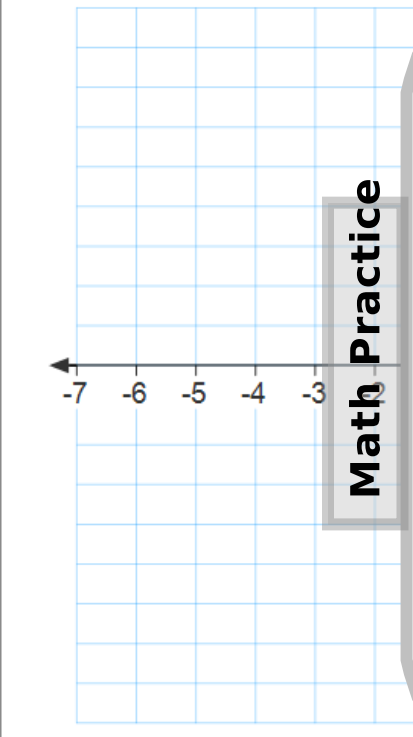


- Place the circle on (-7, -5
- Place the star on $(\frac{1}{4}, 9)$
- Place the triangle on (-6.25, 2)
- Place the square on (3, -9)

In which quadrant is the circle?

Math Practice

Ordered Pairs Practice



Math Practice

MP.2: Reasoning abstractly and quantitatively.

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Which way do I move on the graph based on that number?

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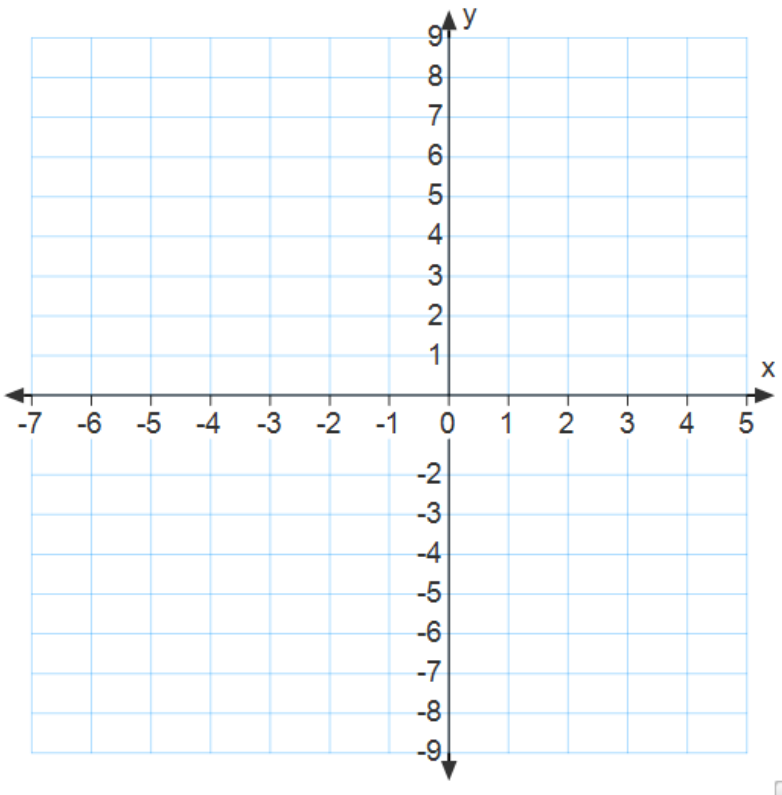
Ordered Pairs Practice

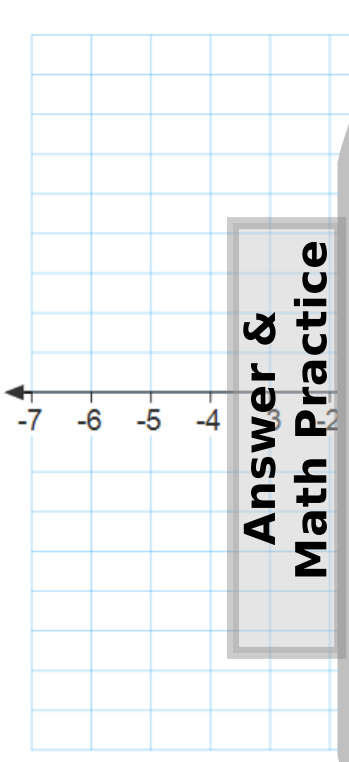


- Place the circle on (-4, -3)
- Place the star on (4, 3)
- Place the triangle on (-4, 3)
- Place the square on (4, -3)

Answer & Math Practice

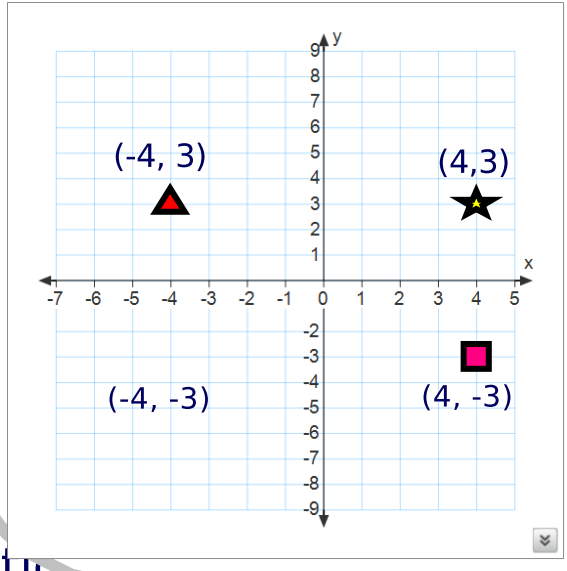
What do you notice about the location of the points in relation to each other? What patterns do you see in the coordinates of the points?

Ordered Pairs Practice



Answer & Math Practice

When two ordered pairs differ only by their signs, the locations of the points are reflections of each other across one or both axes.



The questions on this slide address MP.7.

(-4, -3)

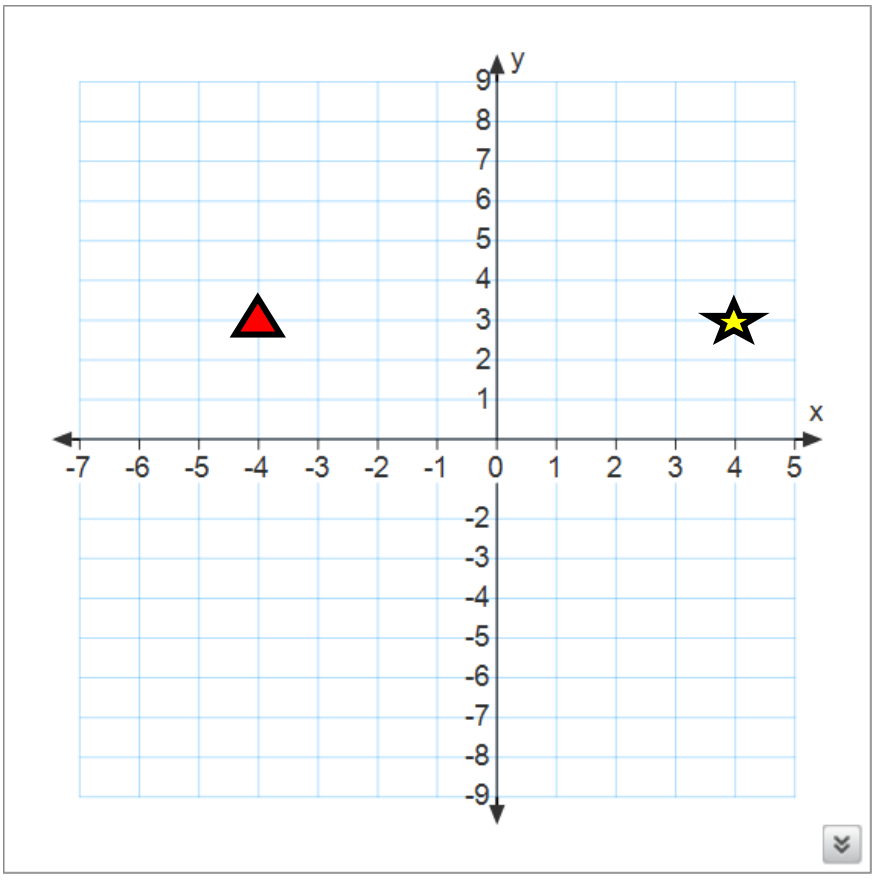
4, 3)

on

(4, -3)

What do you notice about the coordinates of the points in relation to each other? What patterns do you see in the coordinates of the points?

Ordered Pairs Practice

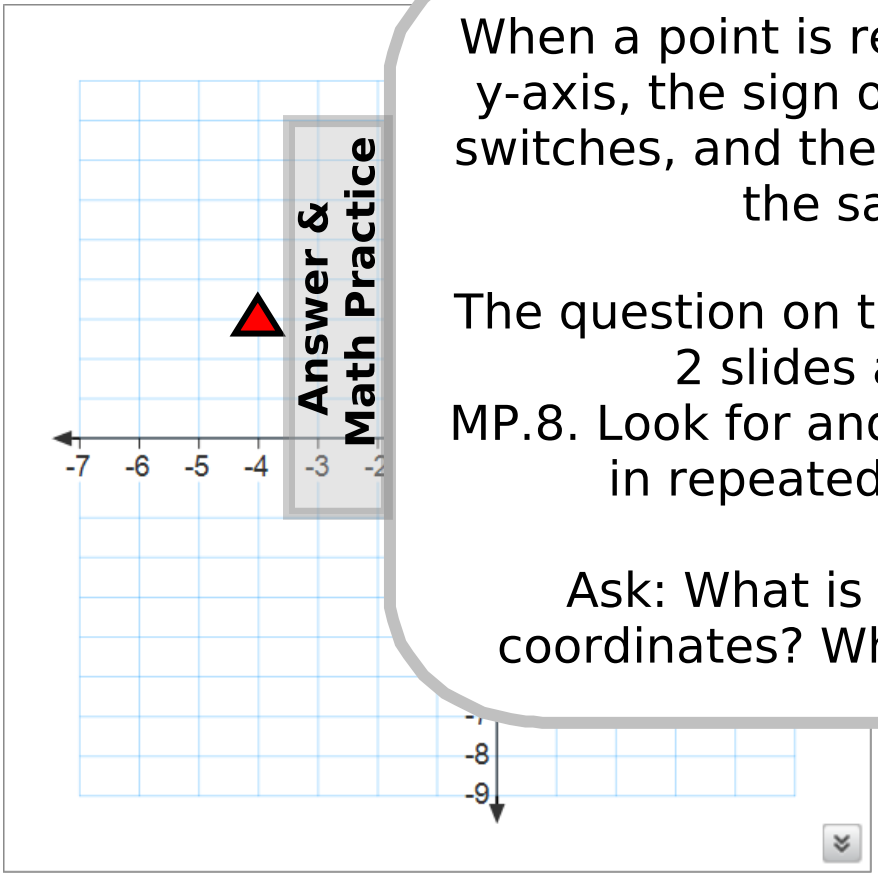


The points (4, 3) and (-4, 3) show a reflection across the y-axis.

What generalization can you make about the coordinates of a point when it is reflected across the y-axis?

Answer & Math Practice

Ordered Pairs Practice



Answer & Math Practice

When a point is reflected across the y-axis, the sign of the x-coordinate switches, and the y-coordinate stays the same.

The question on this slide & the next 2 slides address MP.8. Look for and express regularity in repeated reasoning.

Ask: What is similar in the coordinates? What is different?

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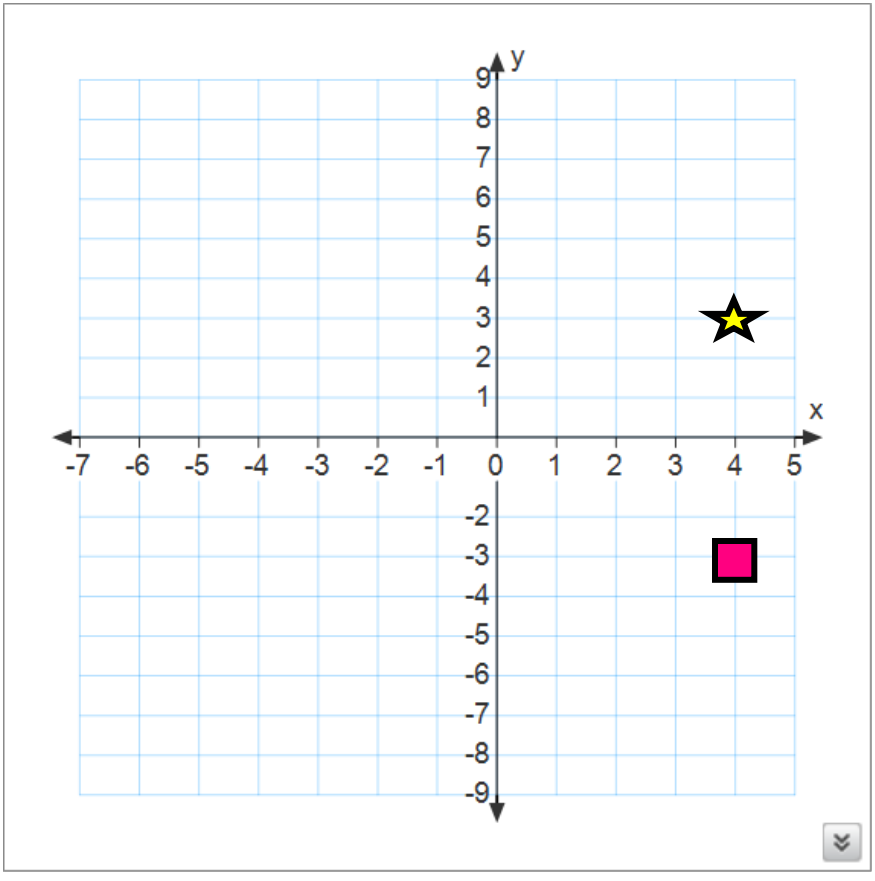
Ordered Pairs Practice

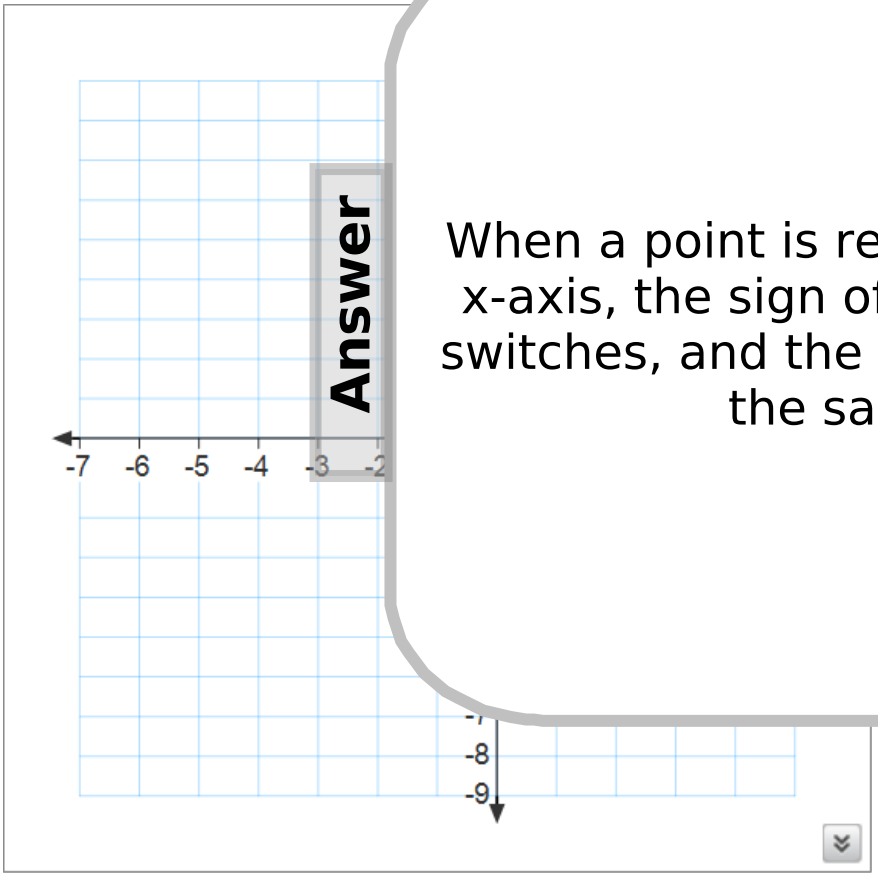


The points (4, 3) and (4, -3) show a reflection across the x-axis.

What generalization can you make about the coordinates of a point when it is reflected across the x-axis?

Answer

Ordered Pairs Practice



When a point is reflected across the x-axis, the sign of the y-coordinate switches, and the x-coordinate stays the same.

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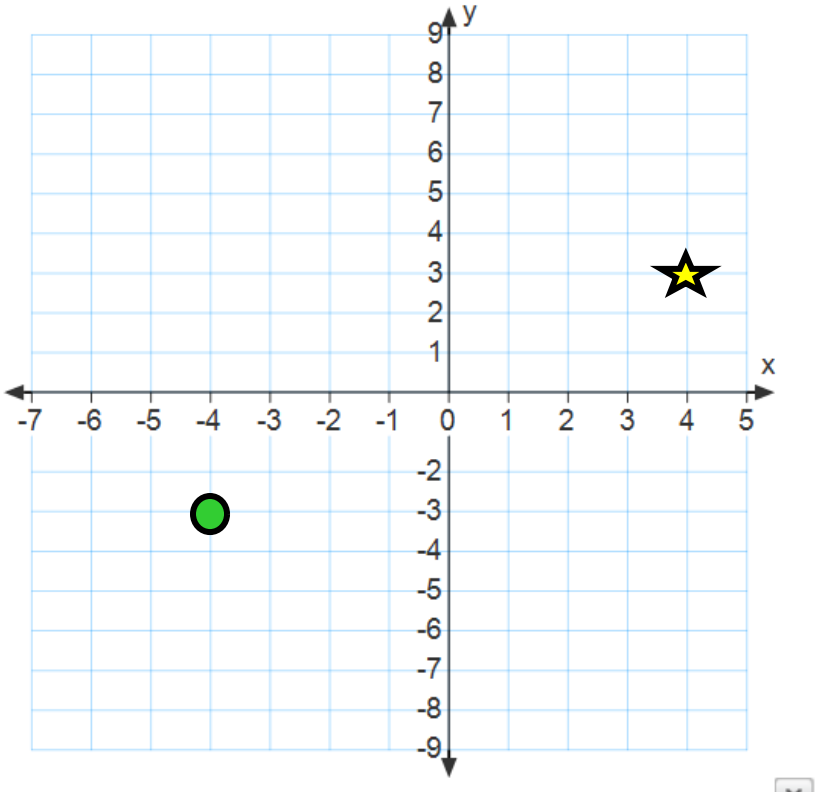
Ordered Pairs Practice

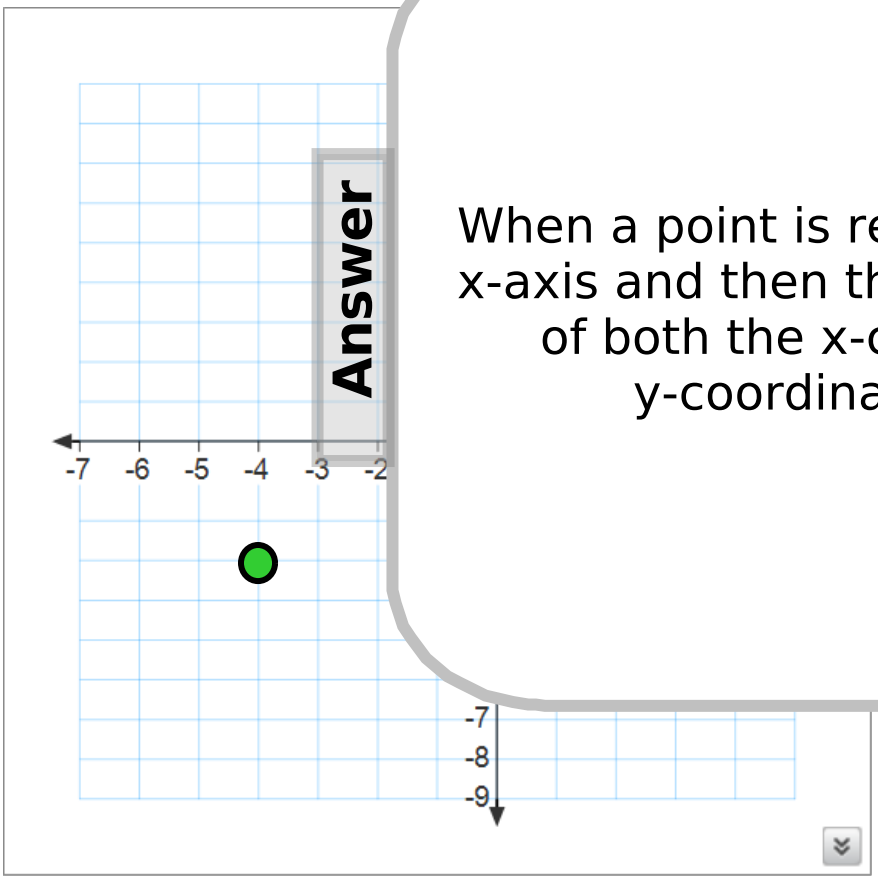


The points (4, 3) and (-4, -3) show a reflection across both the x-axis and y-axis.

What generalization can you make about the coordinates of a point when it is reflected across the x-axis and y-axis?

Answer

Ordered Pairs Practice



When a point is reflected across the x-axis and then the y-axis, the signs of both the x-coordinate and y-coordinate switch.

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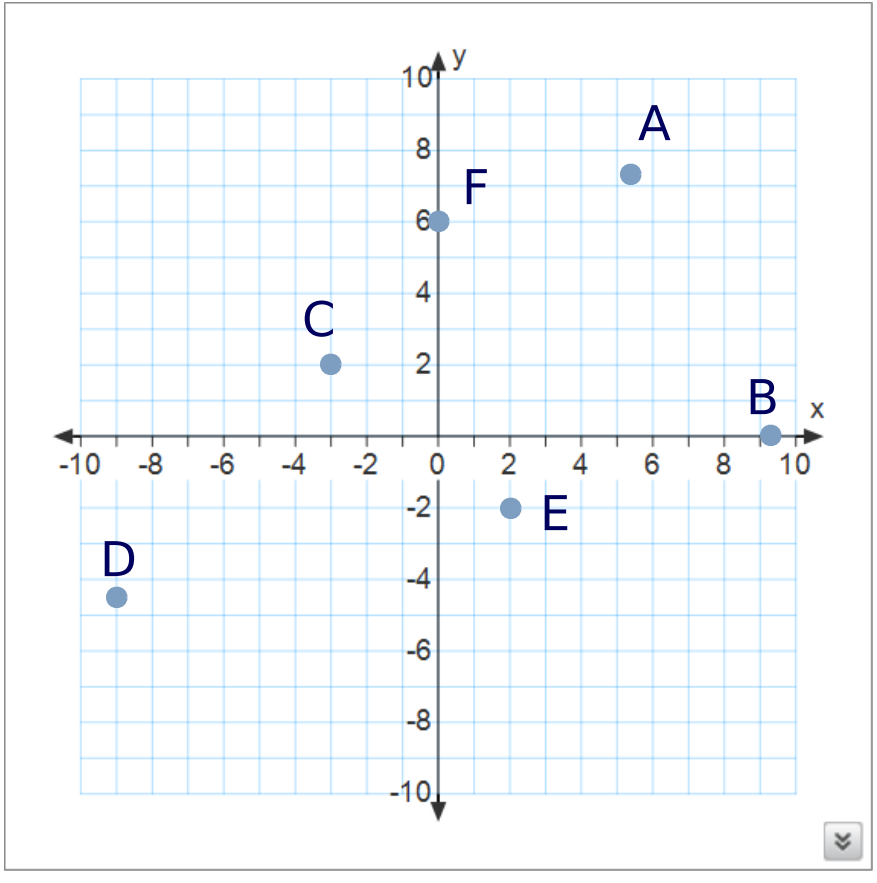
Ordered Pairs Practice

Move the letter to match it to the correct coordinate. Then move the circle to check your answer.



(-9, -4.5) D

(2, -2) E

$(9\frac{1}{4}, 0)$ B

(0, 6) F

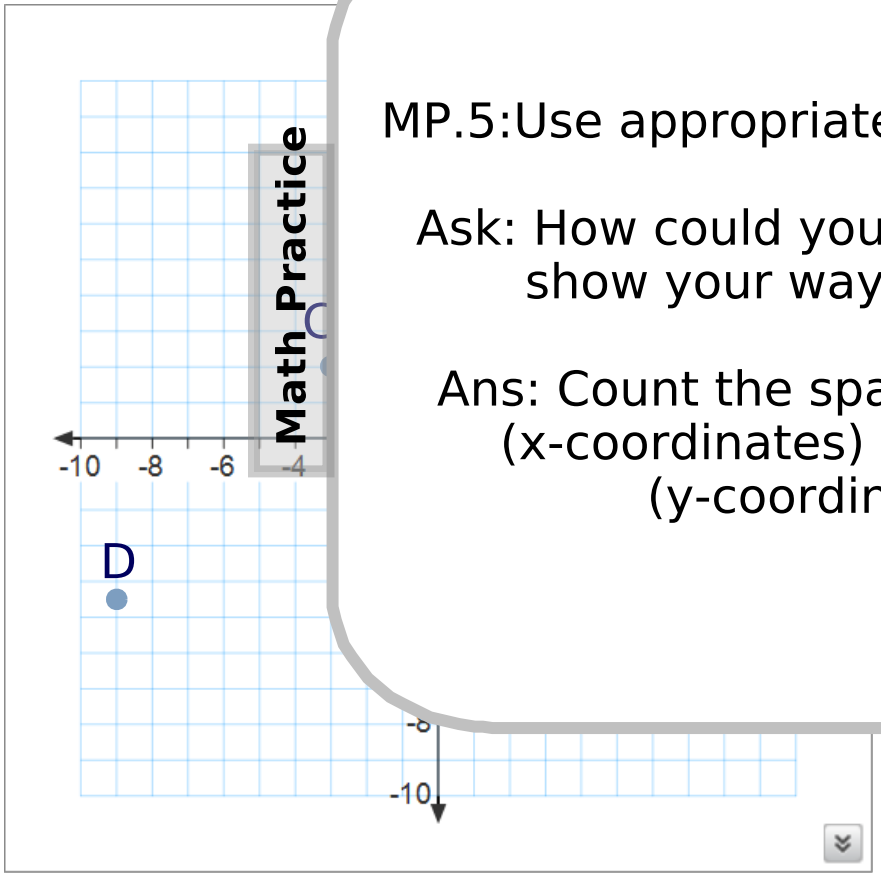
$(5.25, -\frac{1}{3})$ A

(-3, 2) C

Math Practice

Ordered Pairs Practice

Move the letter to match it to the correct coordinate. Then move the circle.



MP.5:Use appropriate tools strategically.

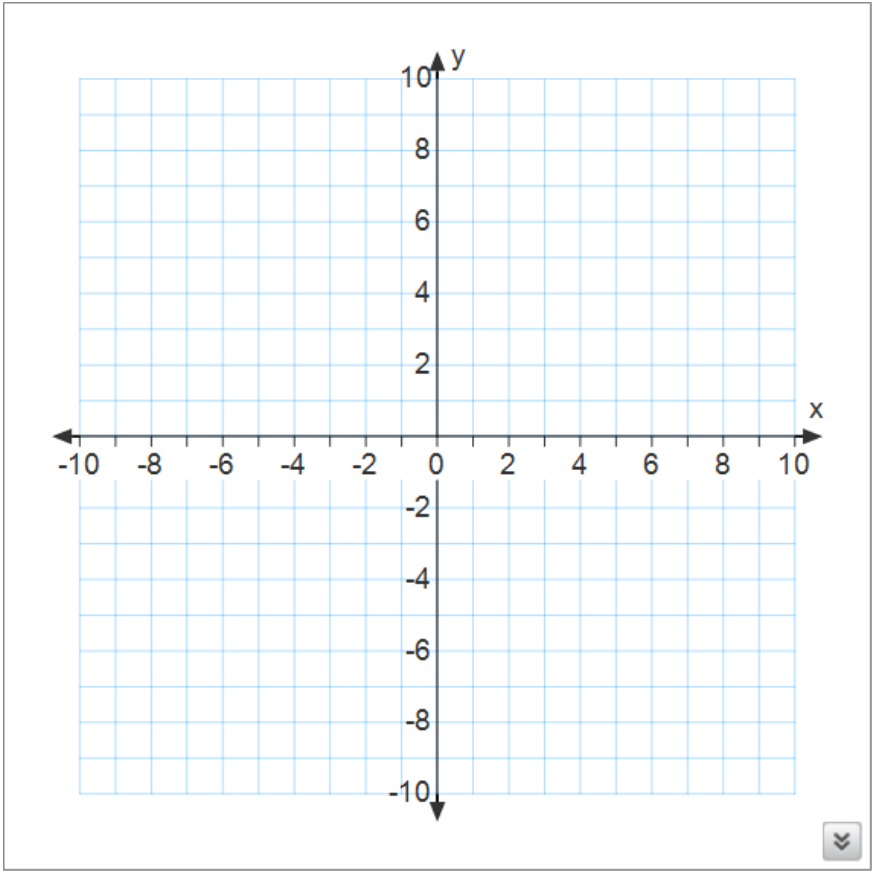
Ask: How could you use the graph to show your way of thinking?

Ans: Count the spaces horizontally (x-coordinates) and vertically (y-coordinates).

(-3, 2) C

6 The point (-5, 4) is located in quadrant_____.

- A I
- B II
- C III
- D IV



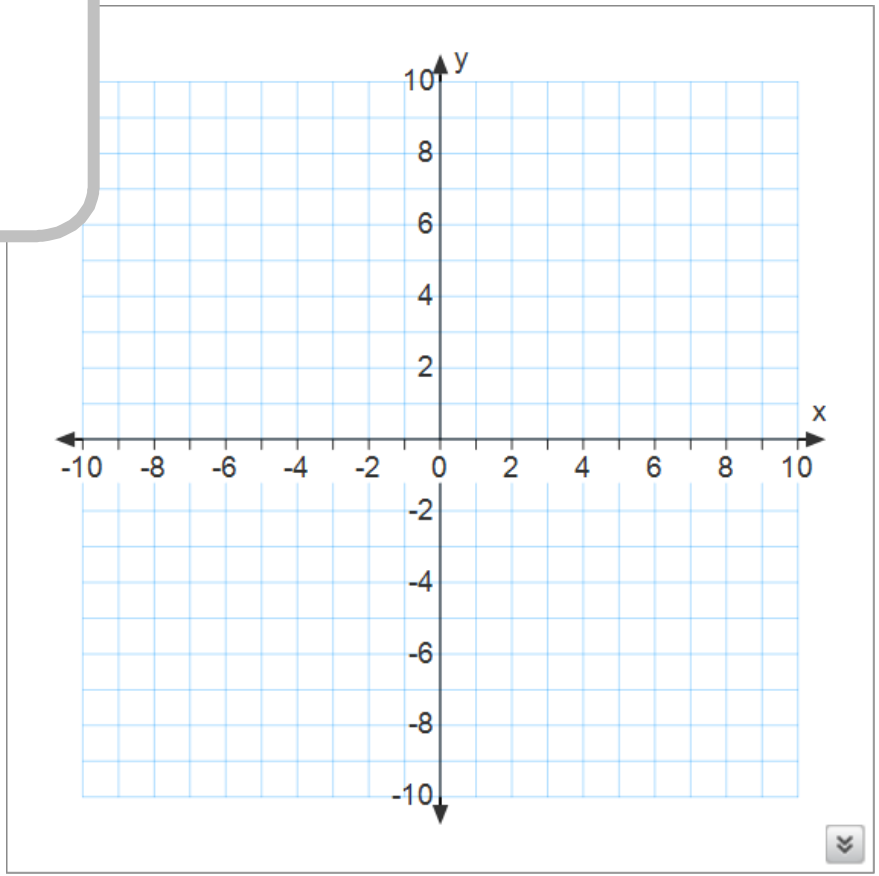
Answer

6 The point (-5, 4) is located in quadrant_____.

- A I
- B II
- C III
- D IV

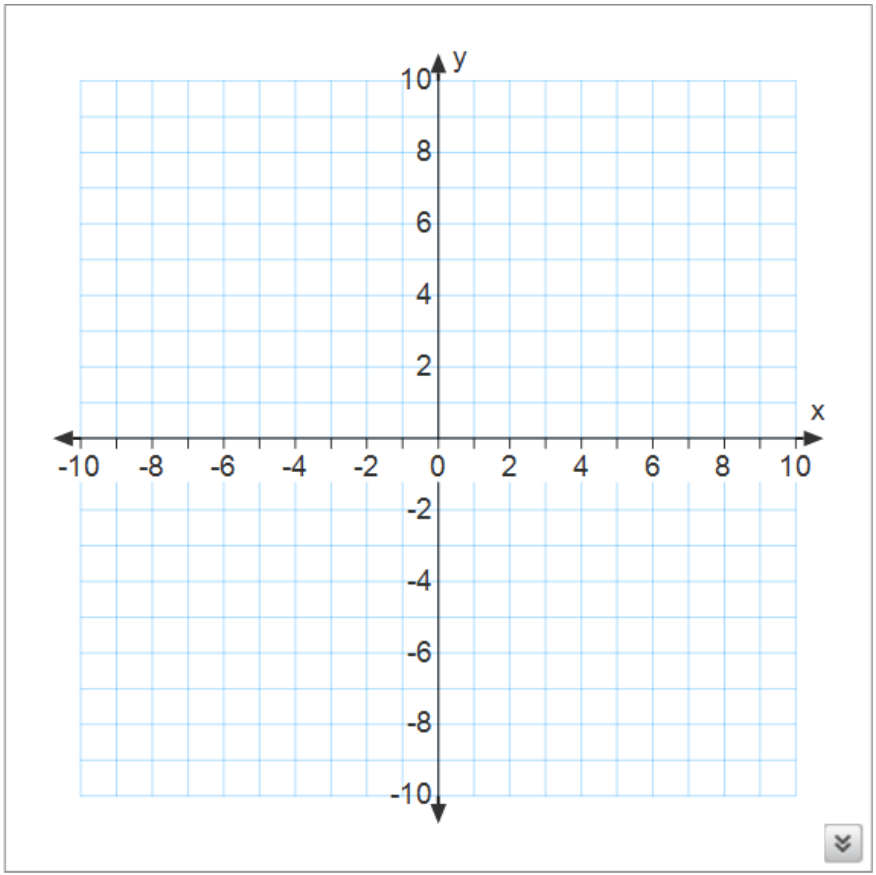
Answer

B



7 The point (7, -2) is located in quadrant _____.

- A I
- B II
- C III
- D IV



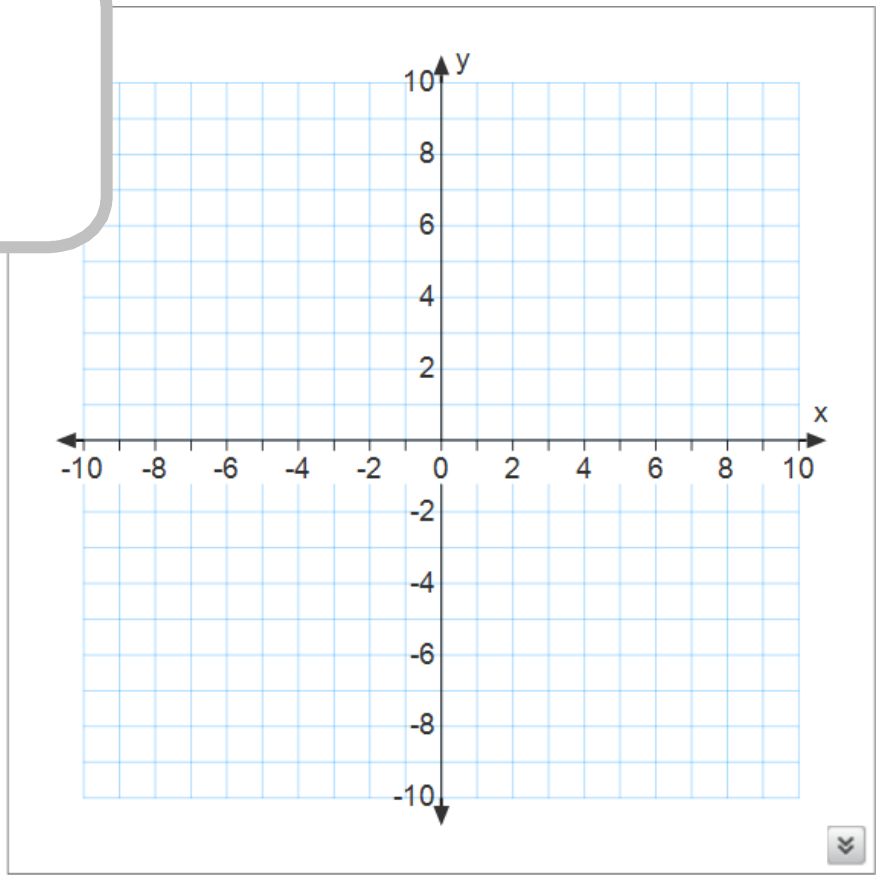
Answer

7 The point (7, -2) is located in quadrant _____.

- A I
- B II
- C III
- D IV

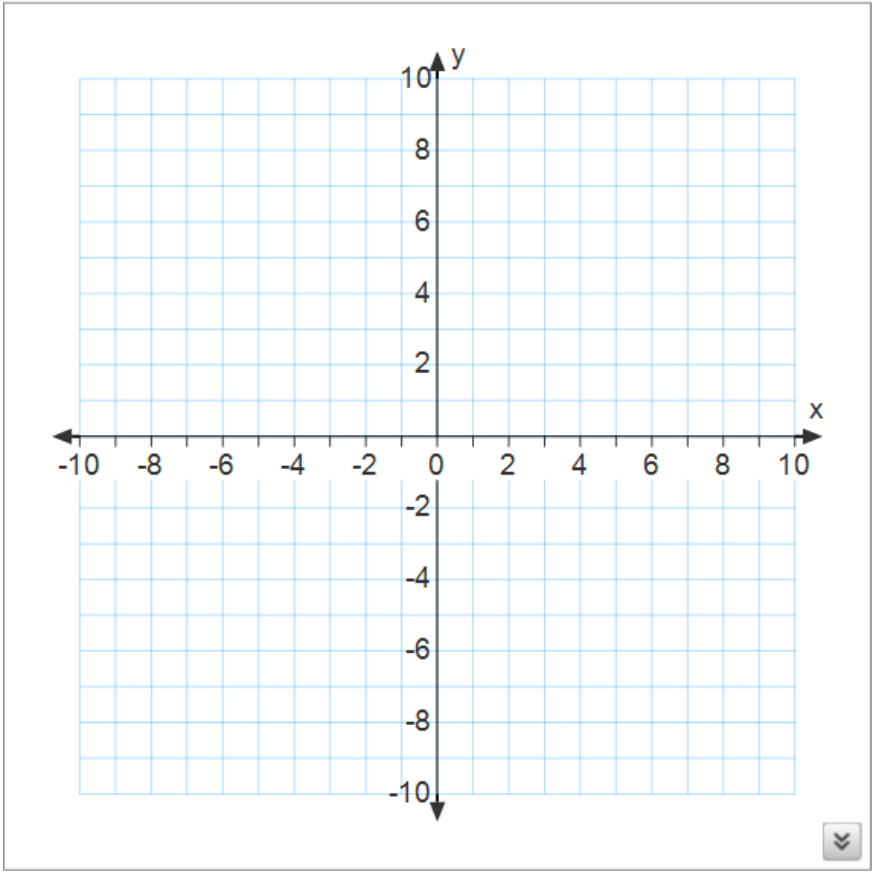
Answer

D



8 The point (4, 5.75) is located in quadrant

- A I
- B II
- C III
- D IV



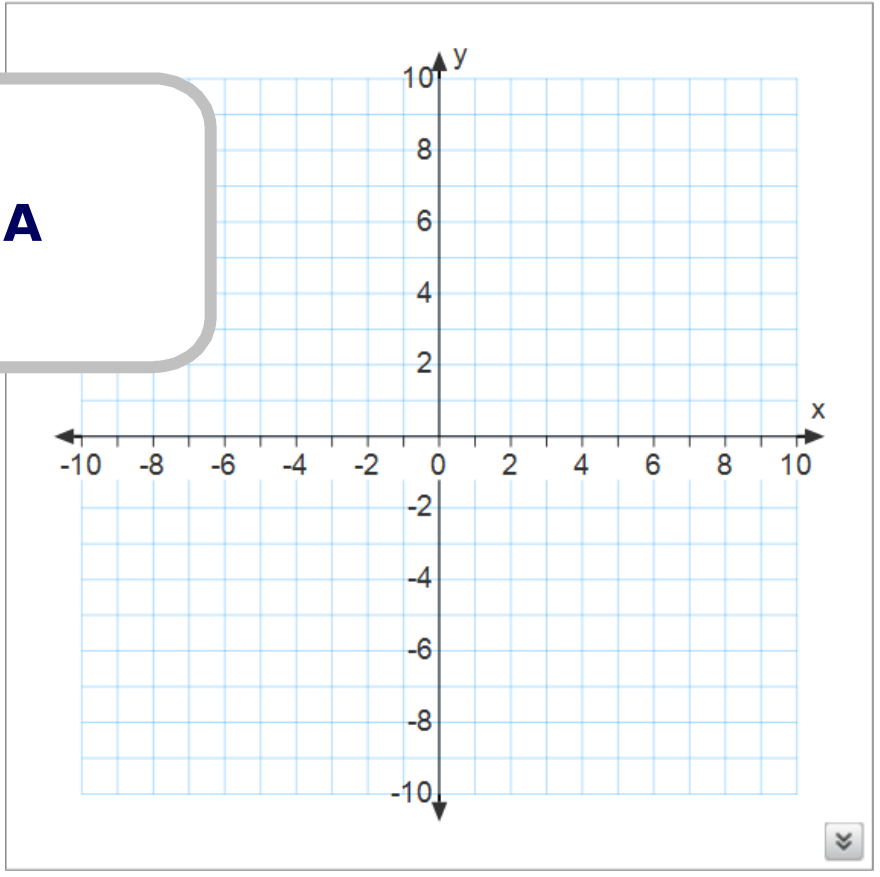
Answer

8 The point (4, 5.75) is located in quadrant

- A I
- B II
- C III
- D IV

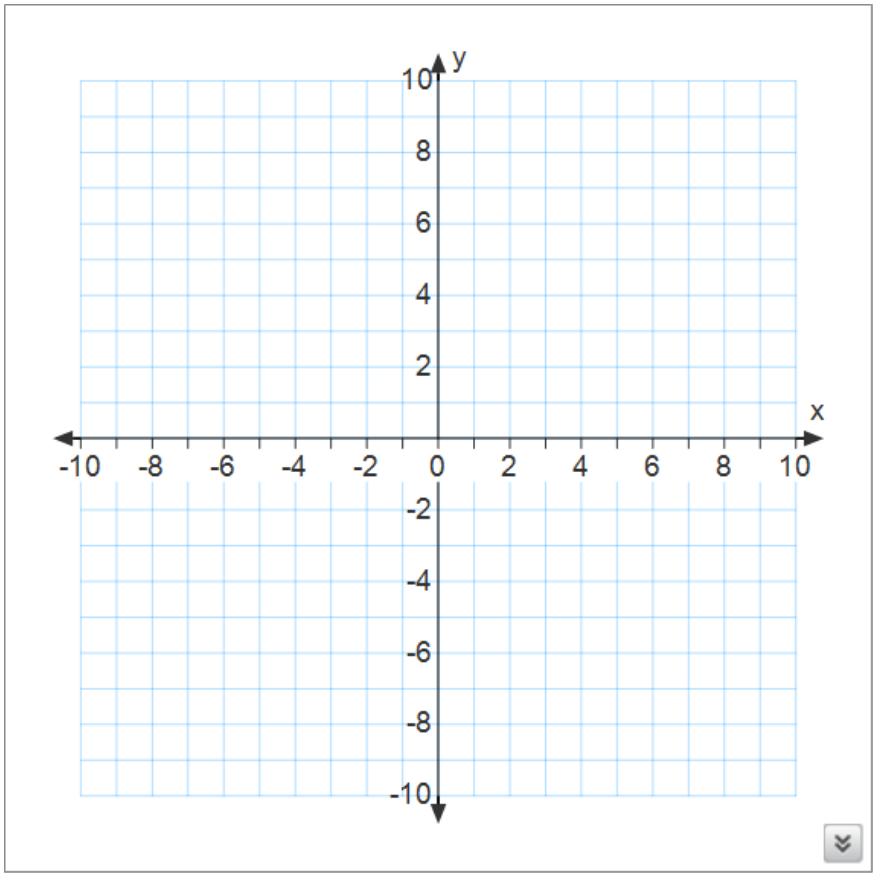
Answer

A



9 The quadrant where the x & y coordinates are both negative is quadrant ___.

- A I
- B II
- C III
- D IV



Answer

9 The quadrant where the x & y coordinates are both negative is quadrant ___.

A I

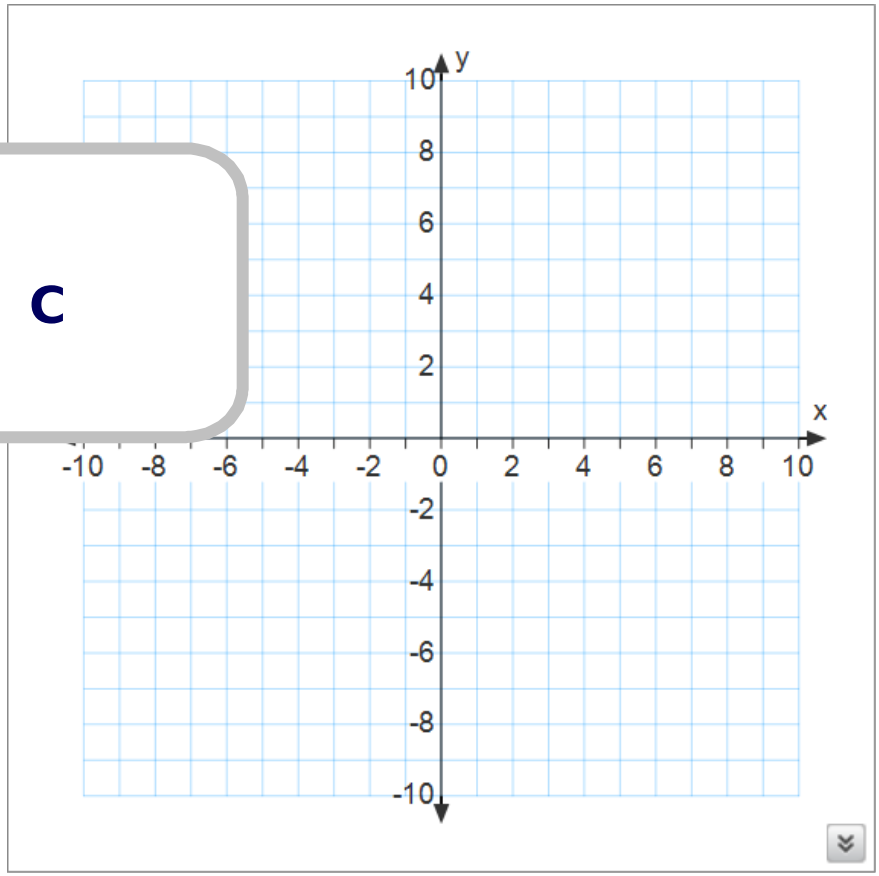
B II

C III

D IV

Answer

C



10 When plotting points in the Cartesian Plane, you alwaysstart at ____.

Answer

- ❑ A the x-axis
- ❑ B the origin
- ❑ C the y-axis
- ❑ D the Coordinate Plane
- ❑ E (0,0)

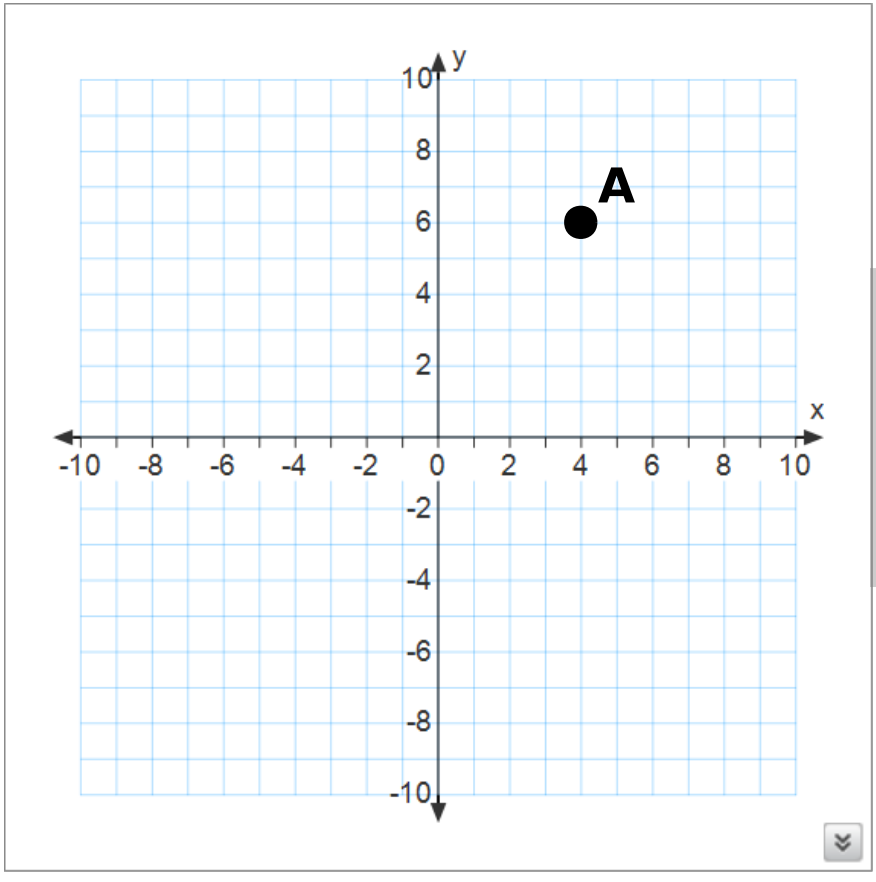
10 When plotting points in the Cartesian Plane, you alwaysstart at

Answer

B, E

- ❑A the
- ❑B the origin
- ❑C the y-axis
- ❑D the Coordinate Plane
- ❑E (0,0)

11



- (4, 6)
- (-4, 6)
- (4, -6)
- (-4, -6)

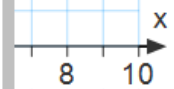
Answer

11

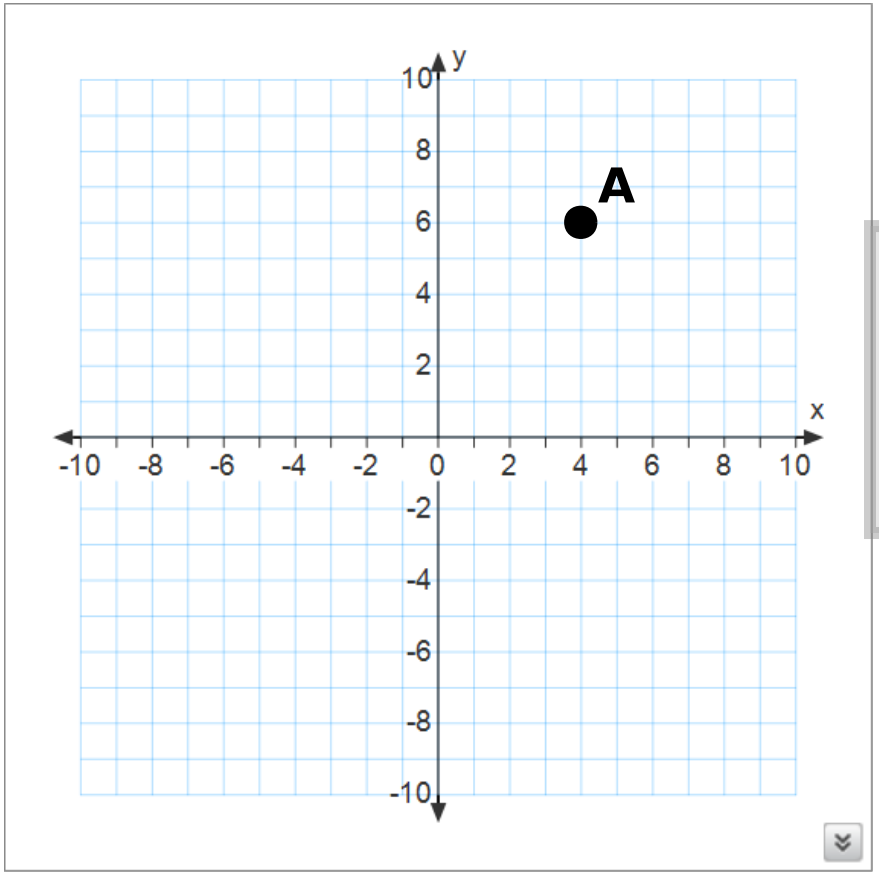
- (4, 6)
- (-4, 6)
- (4, -6)
- (-4, -6)

Answer

B (-4, 6)



12



- (4, 6)
- (-4, 6)
- (4, -6)
- (-4, -6)

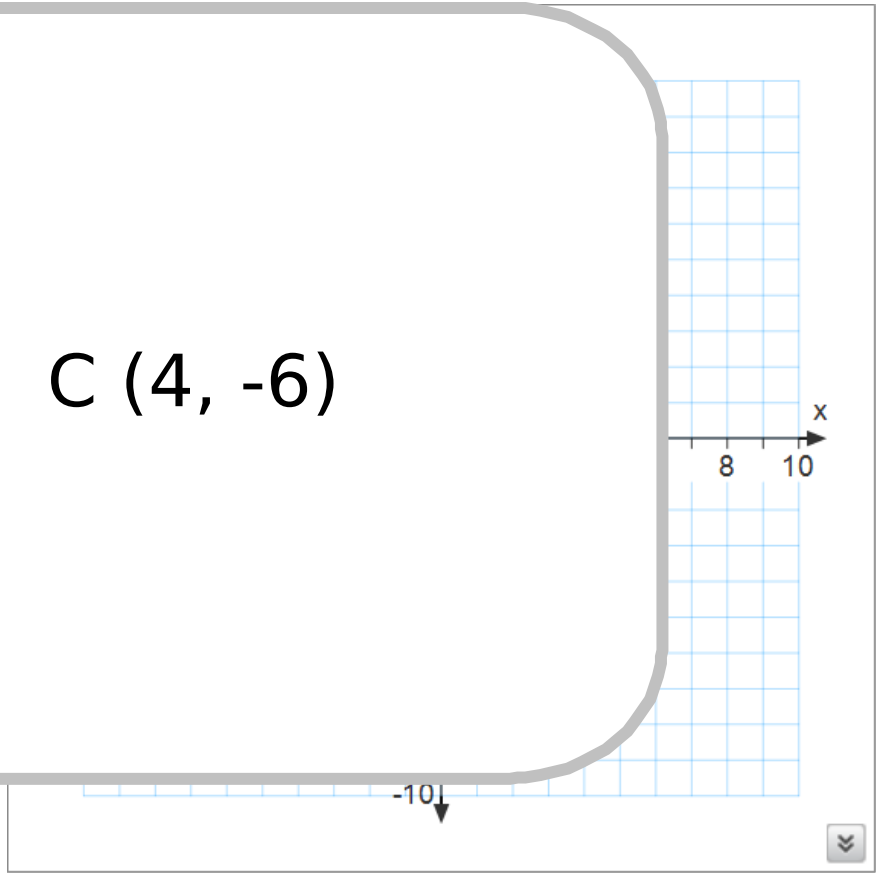
Answer

12

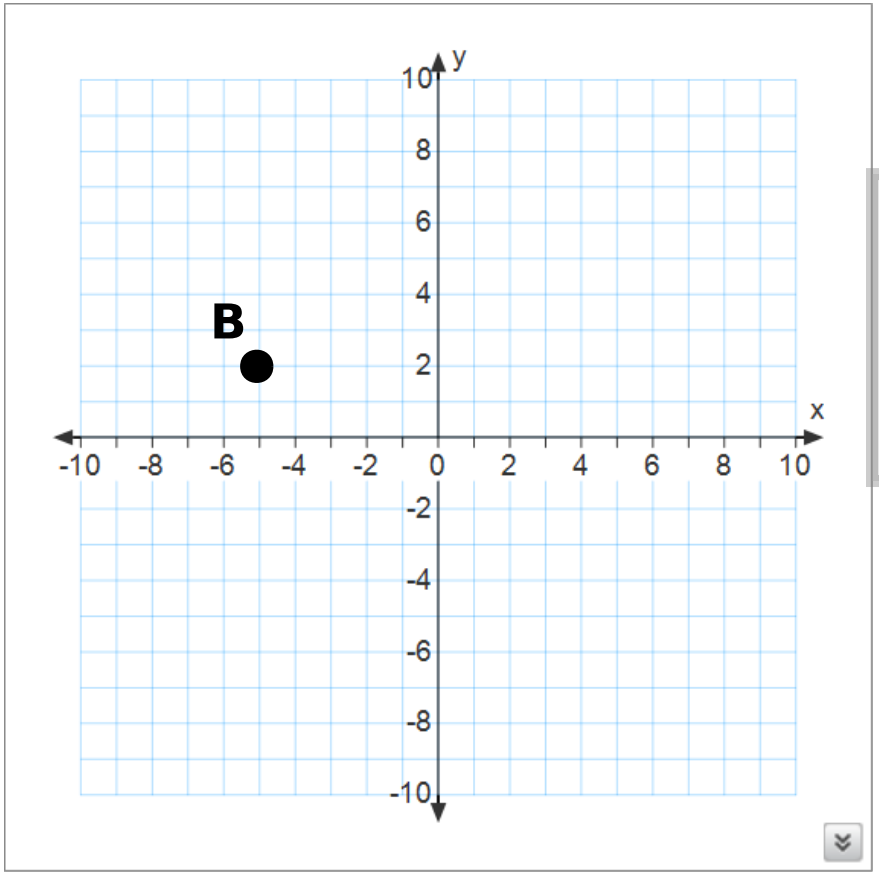
- (4, 6)
- (-4, 6)
- (4, -6)
- (-4, -6)

Answer

C (4, -6)



13



- (5, 2)
- (-5, 2)
- (5, -2)
- (-5, -2)

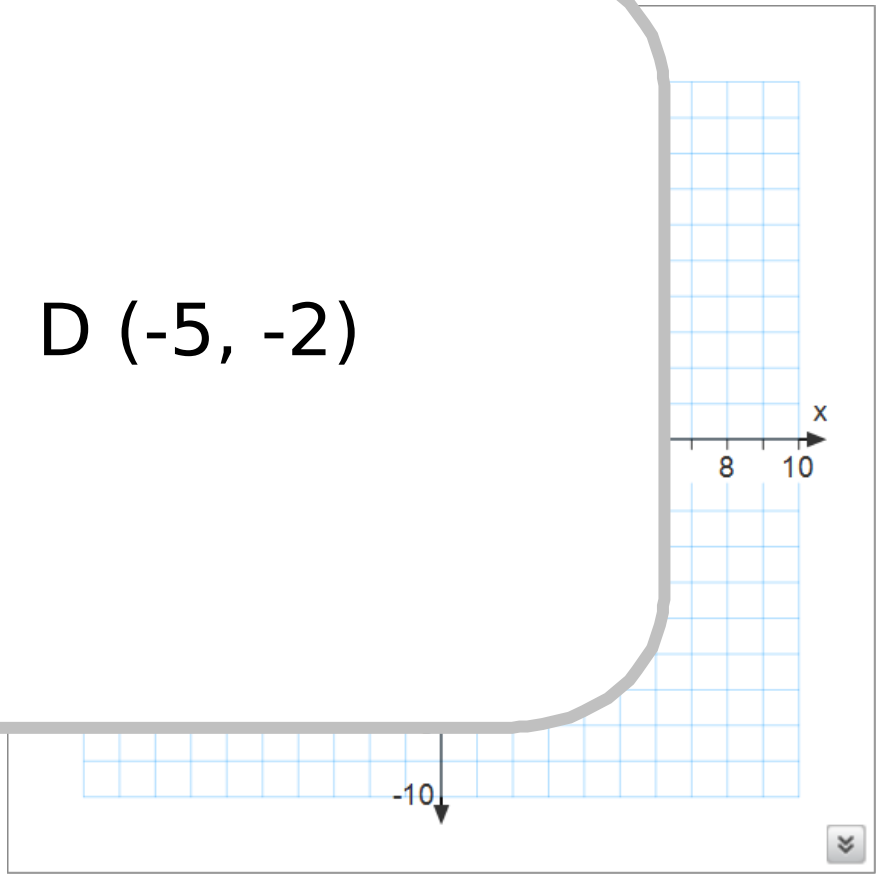
Answer

13

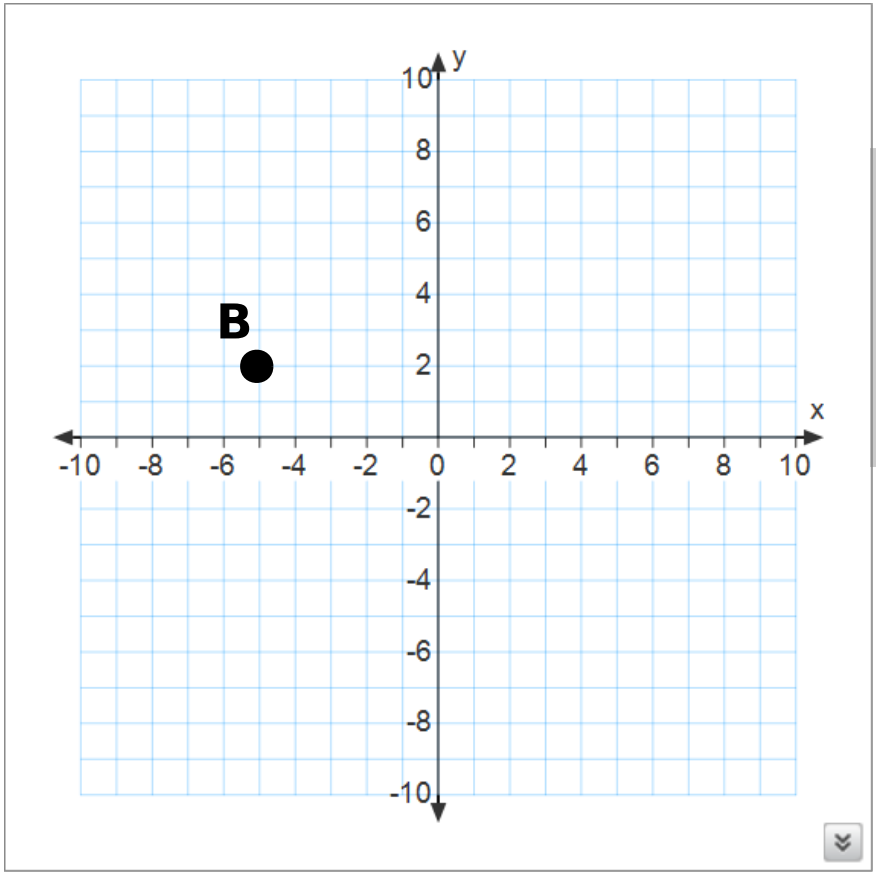
- (5, 2
- (-5,
- (5, -2
- (-5, -2)

Answer

D (-5, -2)



14



Answer

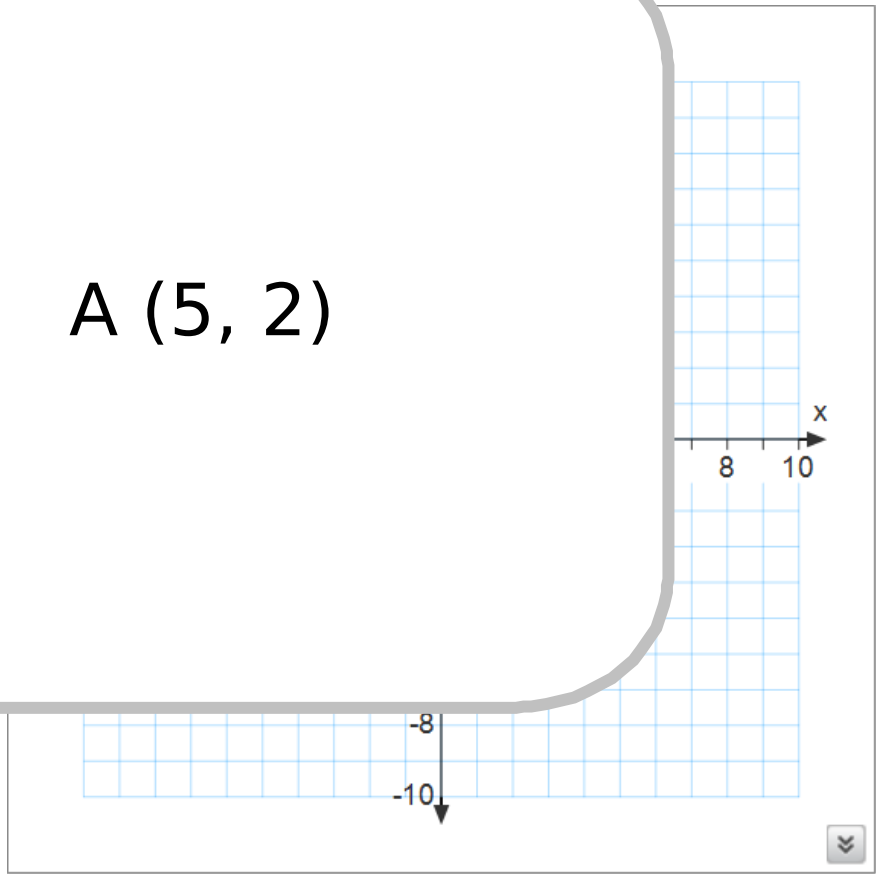
- (5, 2)
- (-5, 2)
- (5, -2)
- (-5, -2)

14

- (5, 2
- (-5, 2
- (5, -2)
- (-5, -2)

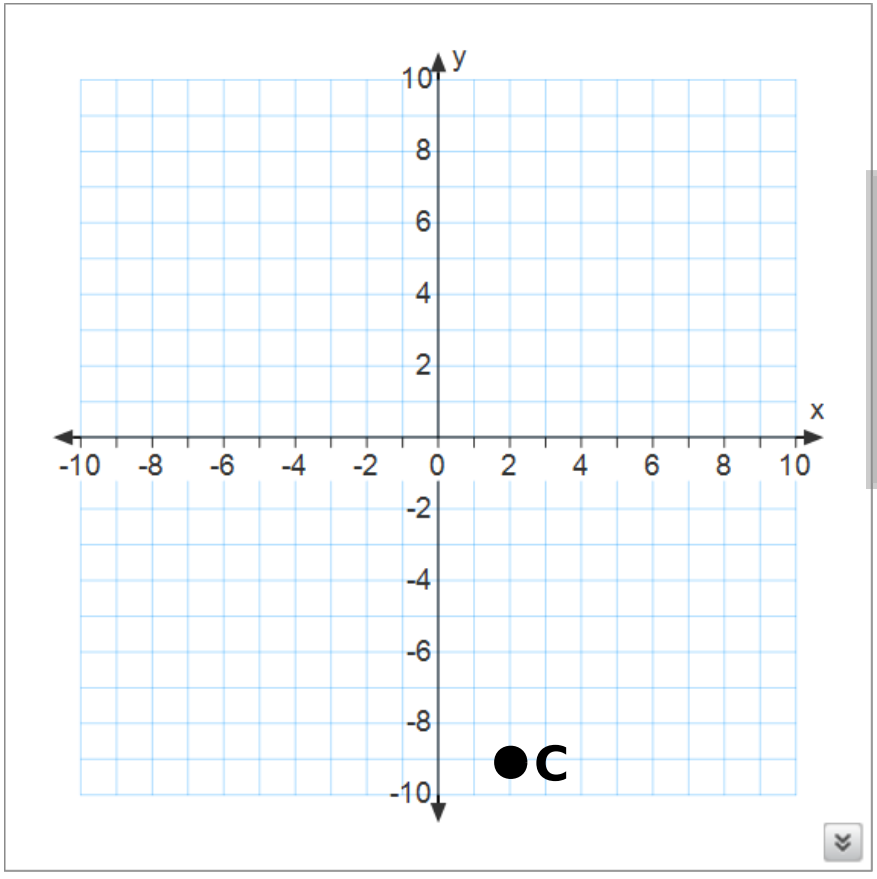
Answer

A (5, 2)



15

- (2, 9)
- (-2, 9)
- (2, -9)
- (-2, -9)



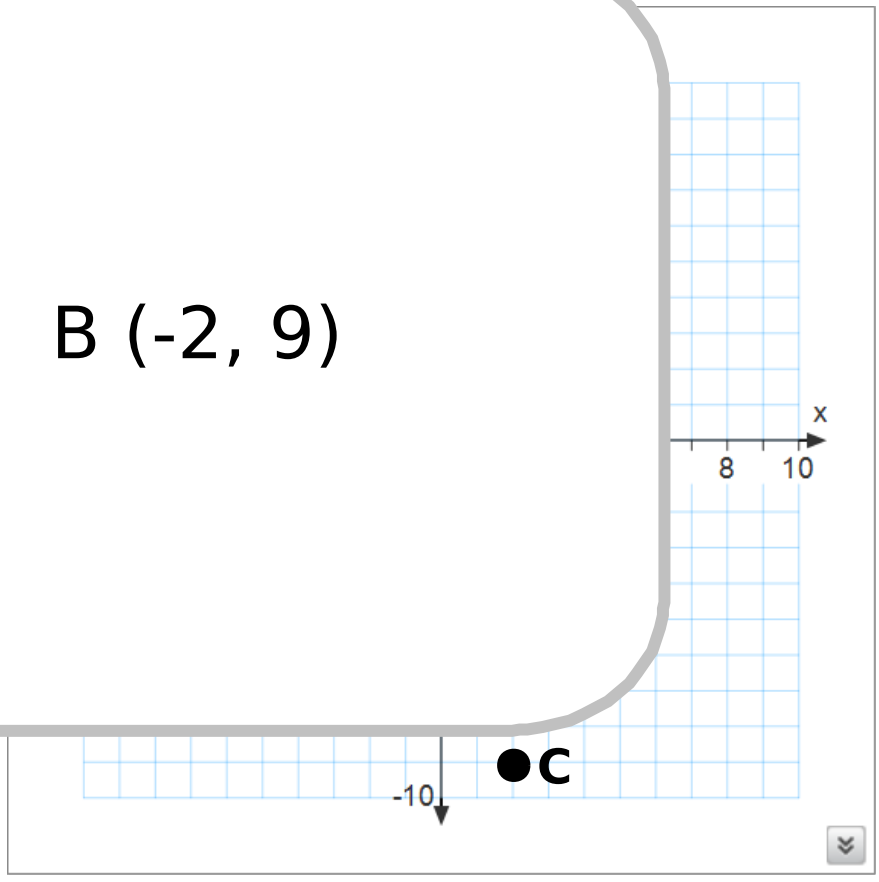
Answer

15

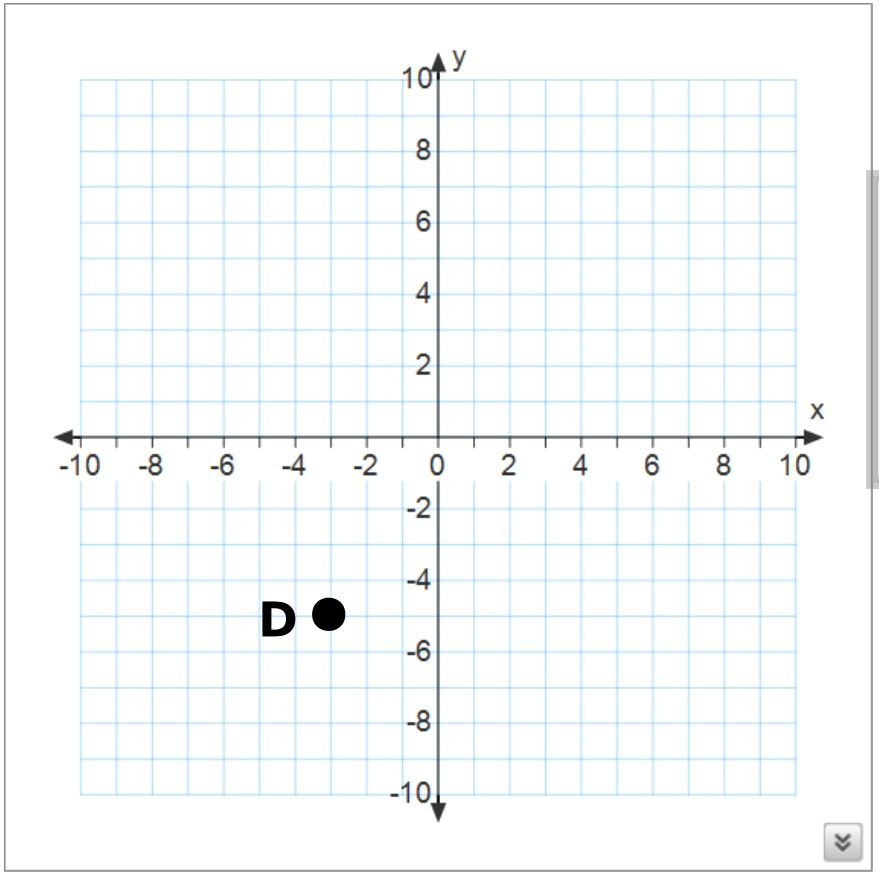
Answer

B (-2, 9)

- (2, 9
- (-2, 9
- (2, -9)
- (-2, -9)



16



Answer

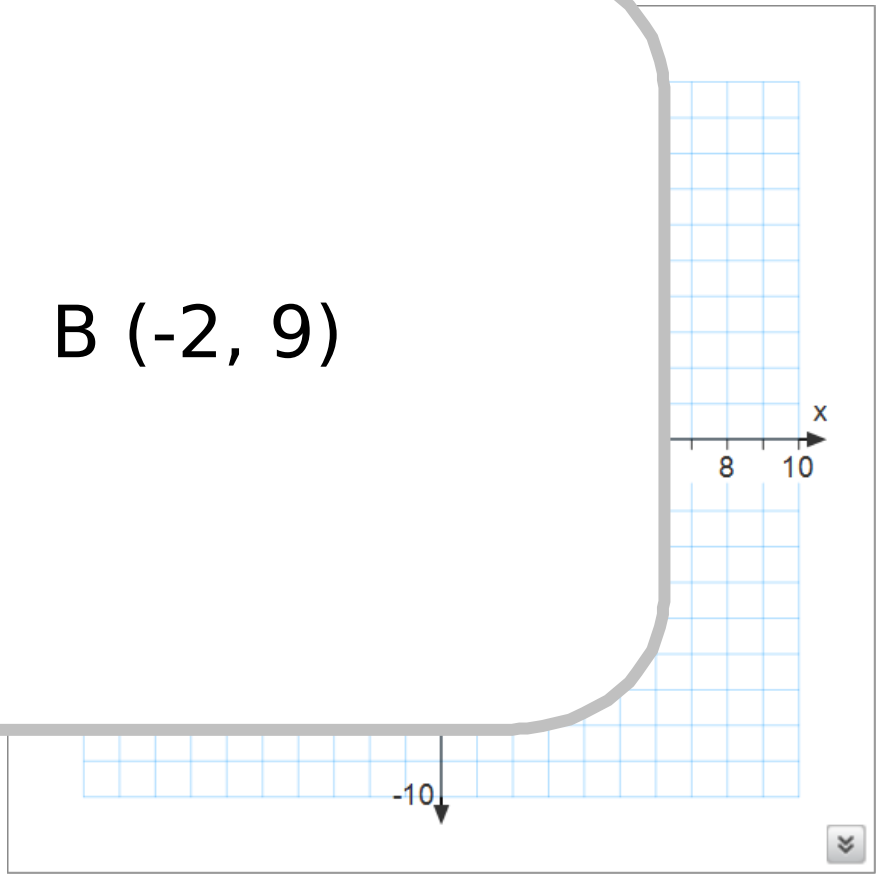
- (3, 5)
- (-3, 5)
- (3, -5)
- (-3, -5)

16

Answer

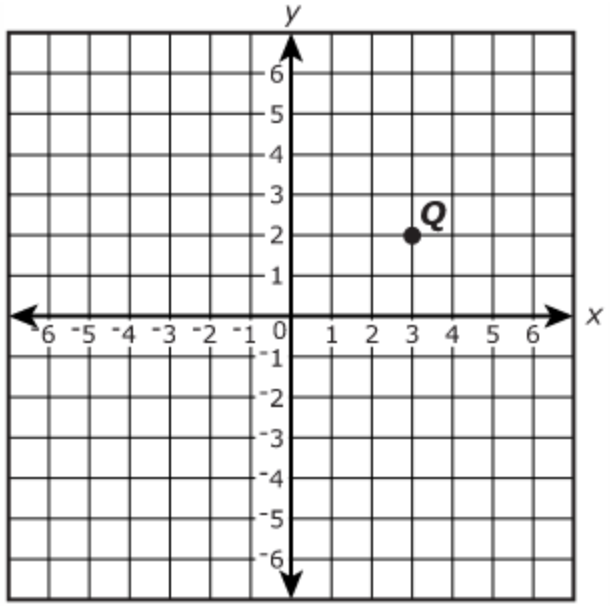
B (-2, 9)

- (3, 5
- (-3, 5
- (3, -5)
- (-3, -5)



- Point Q is plotted on the coordinate plane.

Students typ



Answer

Point Q is reflected across the x-axis.

What are the coordinates of the reflection of point Q?

(___,___)

From PARCC EOY sample test non-calculator #11

- Point Q is plotted on the coordinate plane.

Students

Answer

(3,-2)

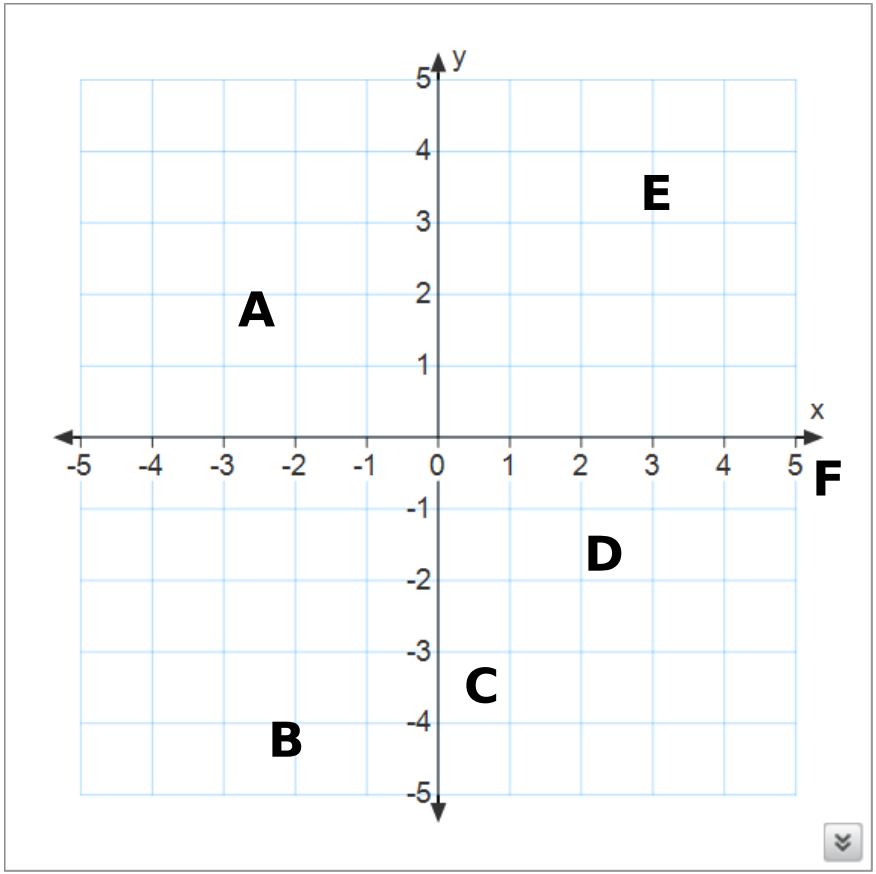
Point Q is r

What are the coordinates of the reflection of point Q?

(___,___)

From PARCC EOY sample test non-calculator #11

Ordered Pairs Practice



List the coordinates of each point

A

B

C

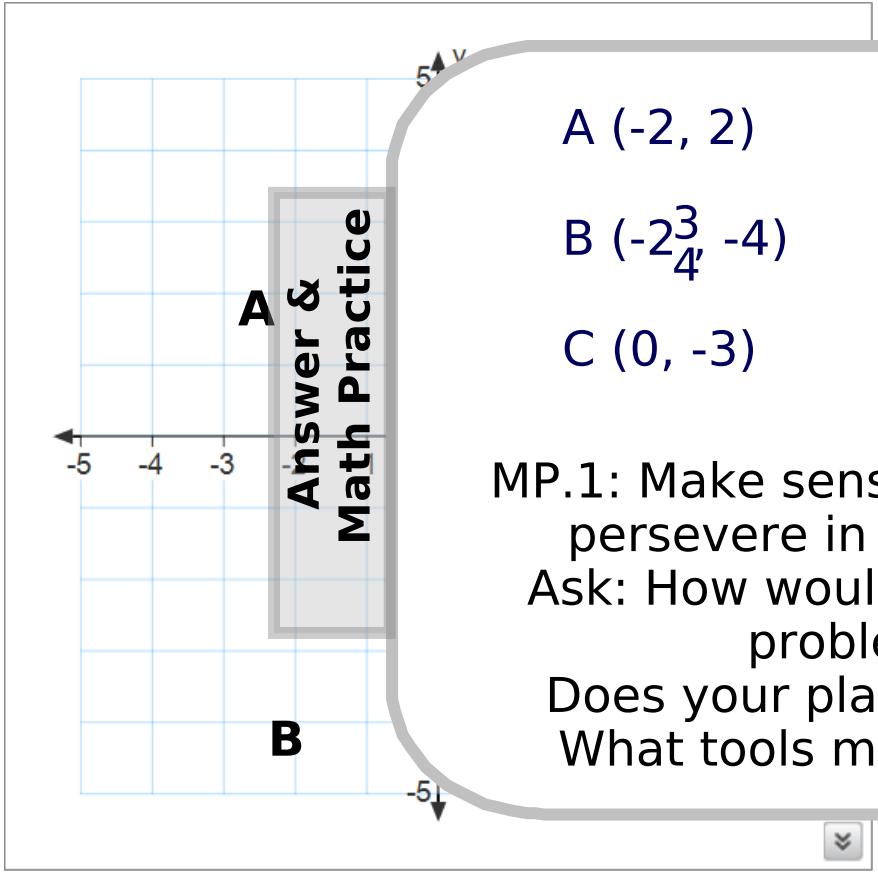
D

E

F

Answer & Math Practice

Ordered Pairs Practice



Answer & Math Practice

A (-2, 2)

B $(-2\frac{3}{4}, -4)$

C (0, -3)

D (2.5, -1)

E (3, 4)

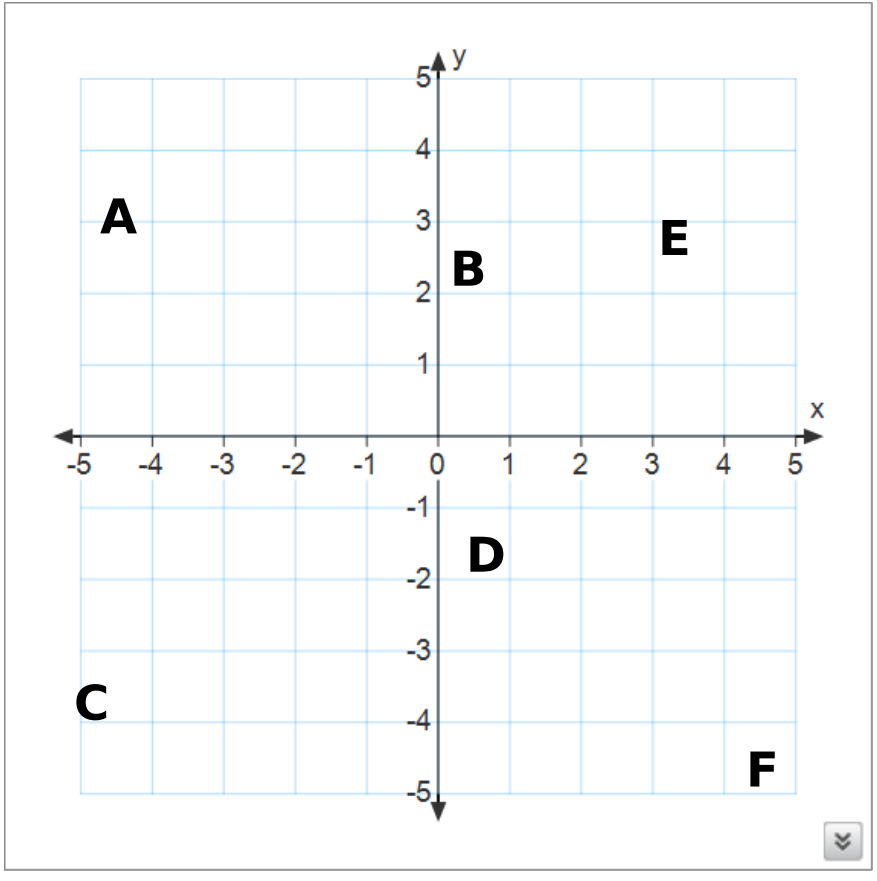
F (5, 0)

MP.1: Make sense of problems & persevere in solving them.
Ask: How would you start this problem?
Does your plan make sense?
What tools might help you?

ates of each

F

Ordered Pairs Practice



List the coordinates of each point

A

B

C

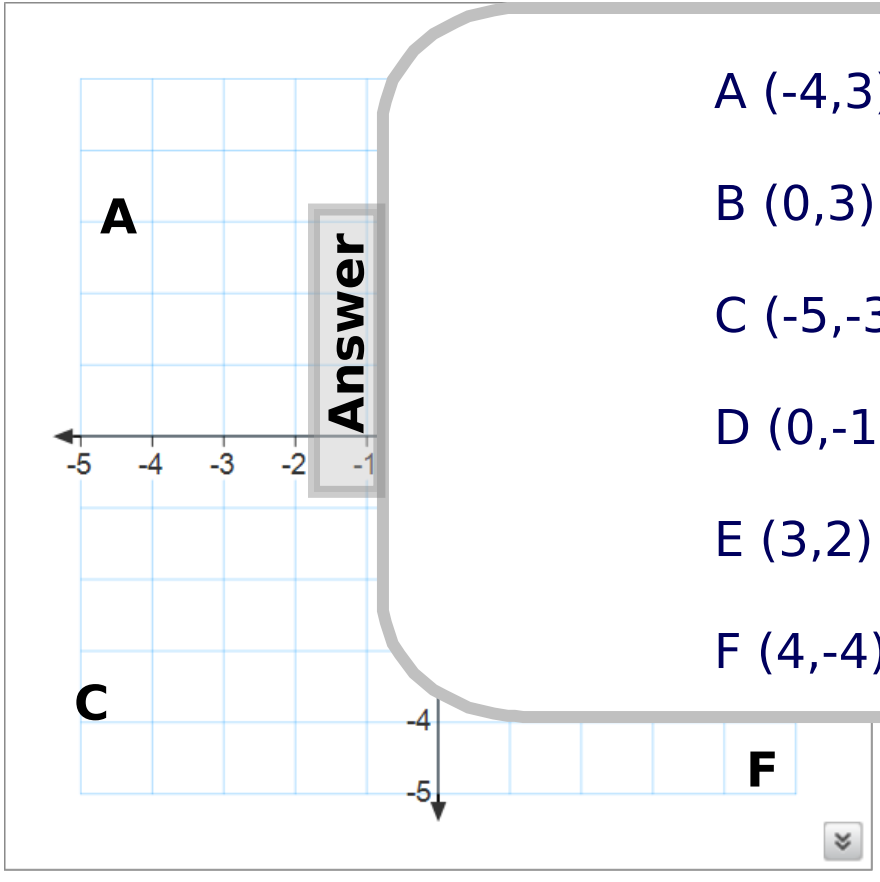
D

E

F

Answer

Ordered Pairs Practice



A (-4,3)

B (0,3)

C (-5,-3)

D (0,-1)

E (3,2)

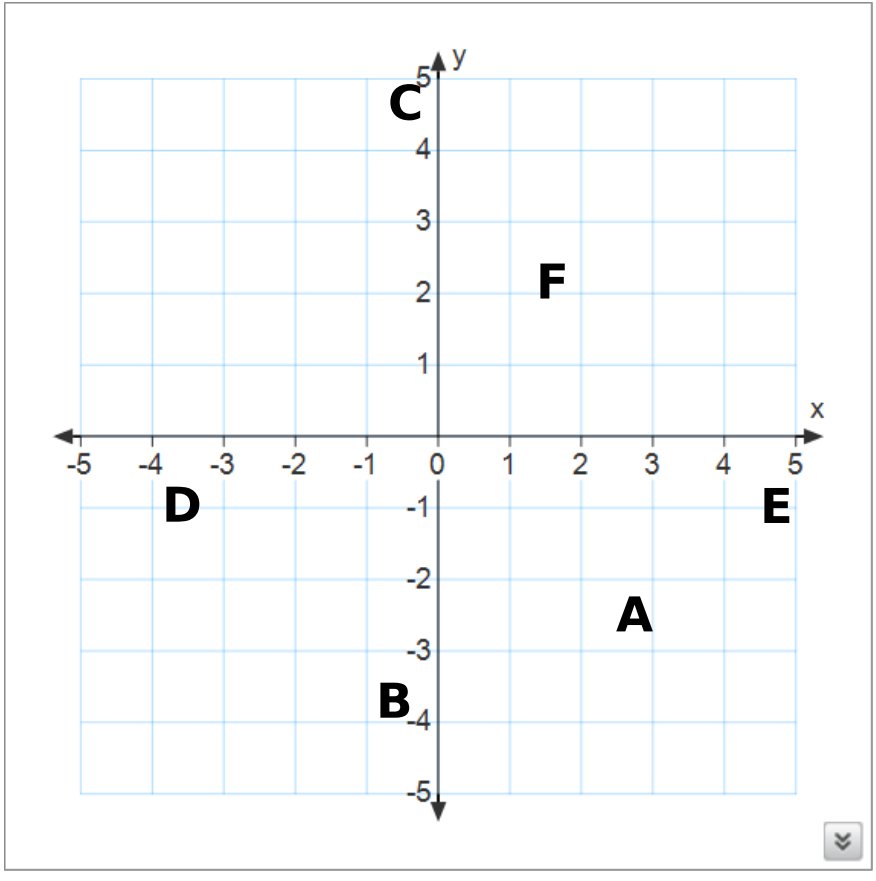
F (4,-4)

dinates of each

E

F

Ordered Pairs Practice



List the coordinates of each point

A

B

C

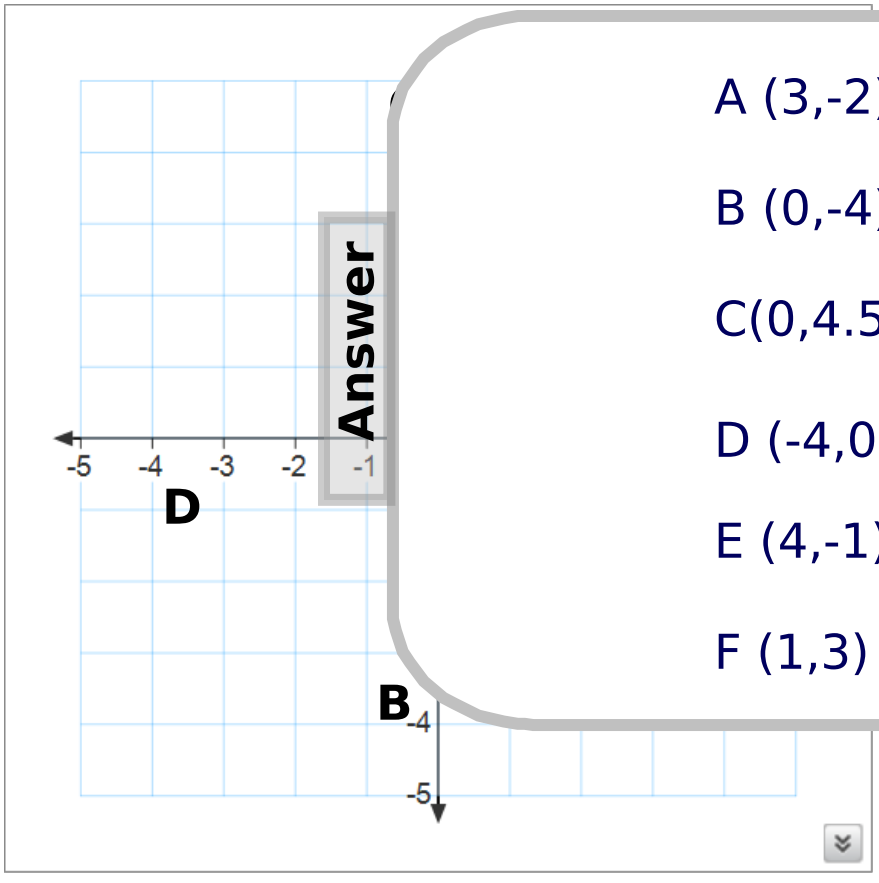
D

E

F

Answer

Ordered Pairs Practice



A (3,-2)

B (0,-4)

C(0,4.5)

D (-4,0)

E (4,-1)

F (1,3)

inates of each

E

F

17 If the x-coordinate is positive, the point plotted will be in quadrant _____.

- A I
- B I & II
- C I & IV
- D II

Answer

17 If the x-coordinate is positive, the point plotted will be in quadrant _____.

- A I
- B I & II
- C I & IV
- D II

Answer

C

18 If the y-coordinate is positive, the point plotted will be in quadrant _____.

- A I
- B I & II
- C I & IV
- D II

Answer

18 If the y-coordinate is positive, the point plotted will be in quadrant _____.

- A I
- B I & II
- C I & IV
- D II

Answer

B

19 If the x - coordinate is negative and the y - coordinate is positive, the point to be plotted will be in quadrant _____.

A I

B I & II

C I & IV

D II

Answer

19 If the x - coordinate is negative and the y-coordinate is positive, the point to be plotted will be in quadrant _____.

- A I
- B I & III
- C I & IV
- D II

Answer

D

20 If the x - coordinate is positive and the y-coordinate is negative, the point to be plotted will be in quadrant _____.

- A I
- B II
- C III
- D IV

Answer

20 If the x - coordinate is positive and the y-coordinate is negative, the point to be plotted will be in quadrant _____.

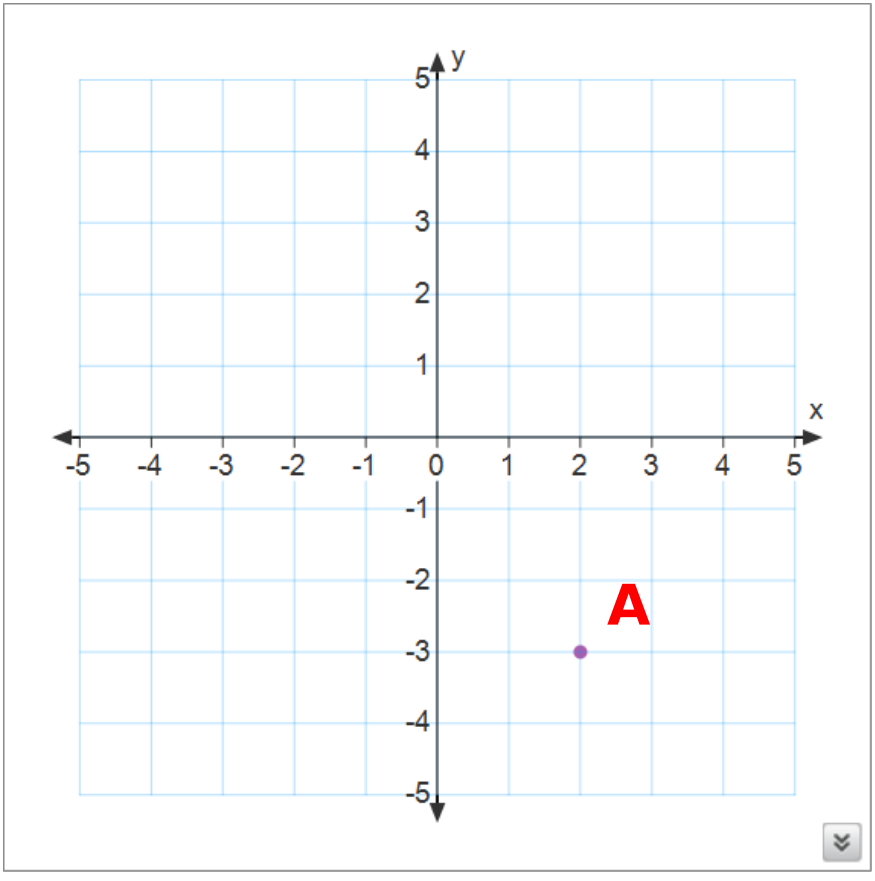
- A I
- B II
- C III
- D IV

Answer

D

21 Point A is located at (-3, 2)

- True
- False



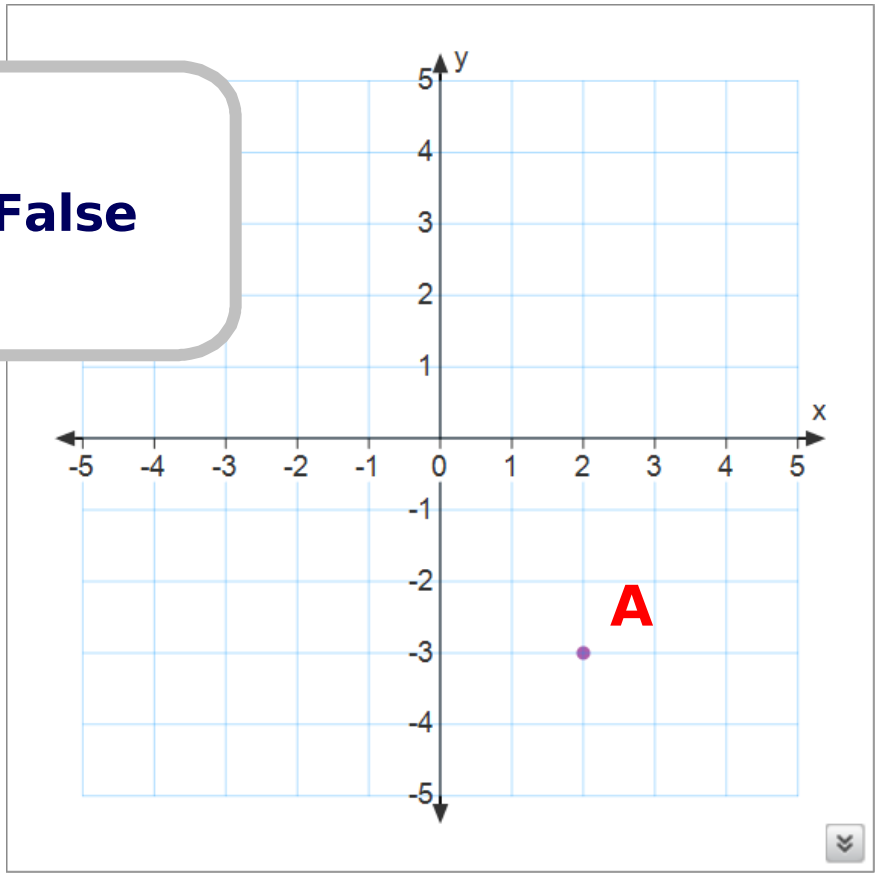
Answer

21 Point A is located at (-3, 2)

- True
- False

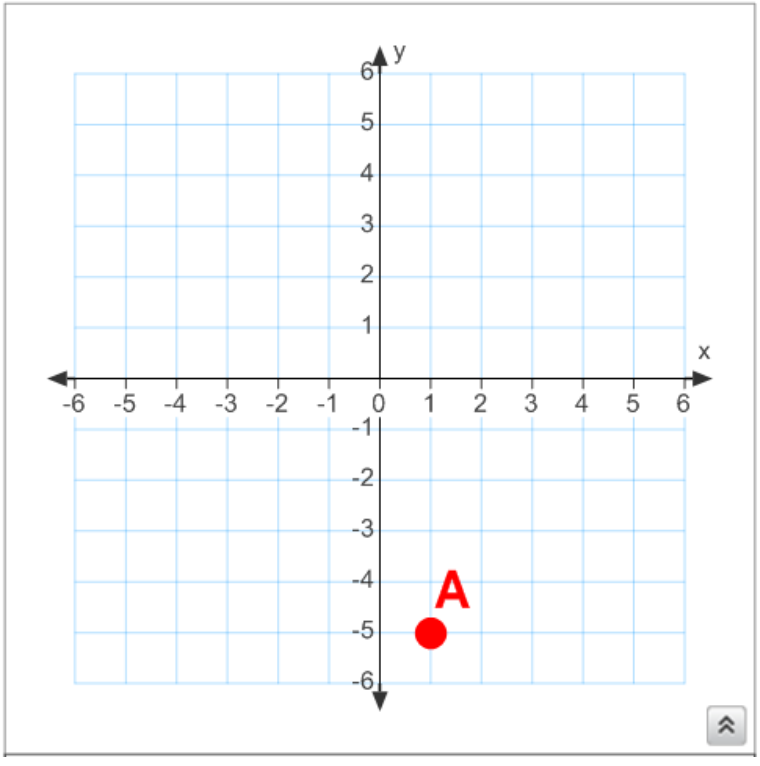
Answer

False



22 Point A is located at (-5, 1)

- True
- False



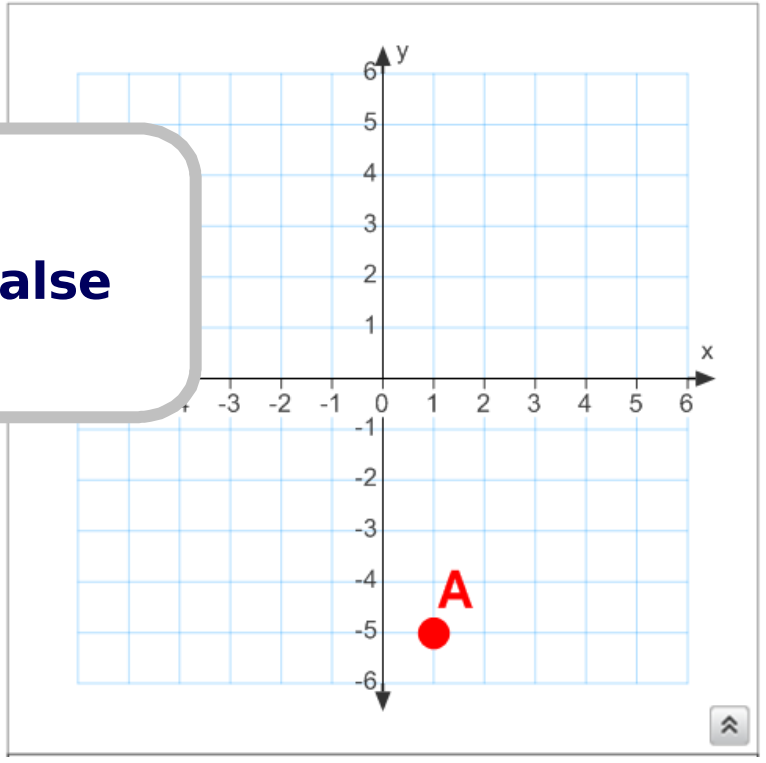
Answer

22 Point A is located at (-5, 1)

- True
- False

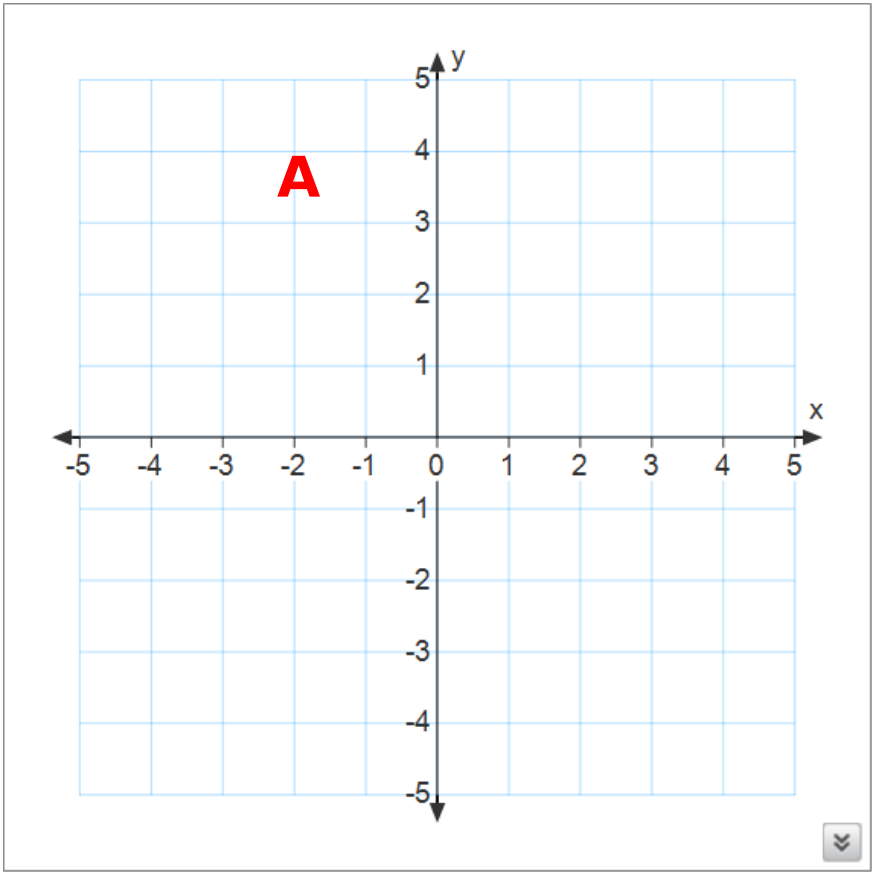
Answer

False



23 Point A is located at (-2.5, 3)

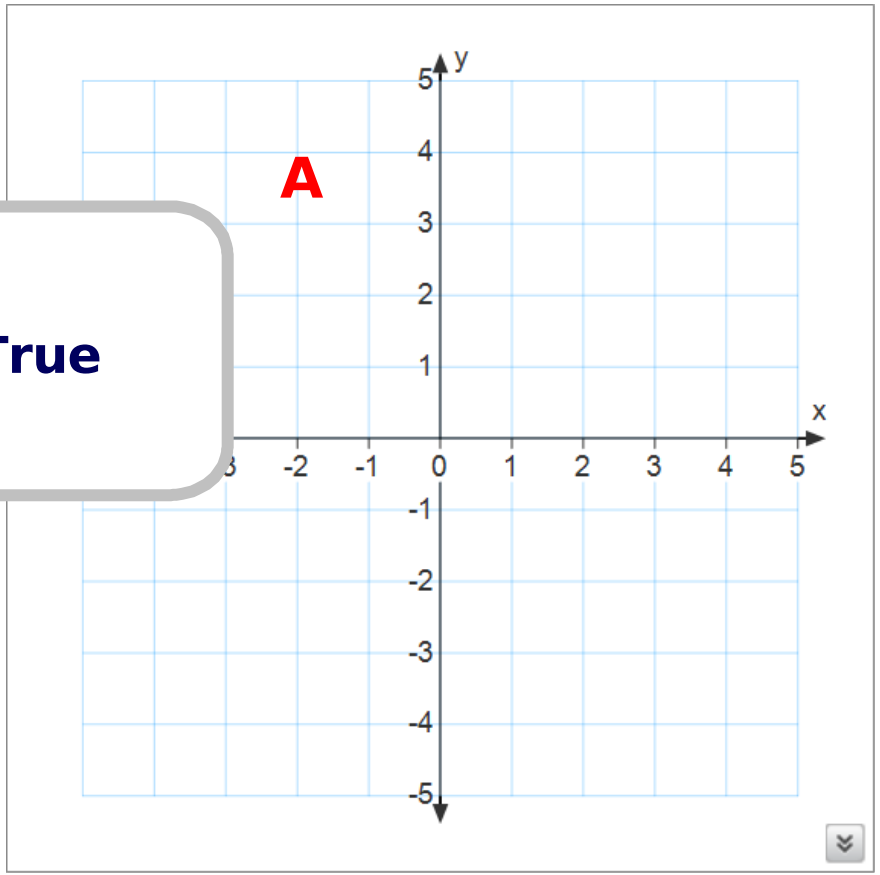
- True
- False



Answer

23 Point A is located at (-2.5, 3)

- True
- False

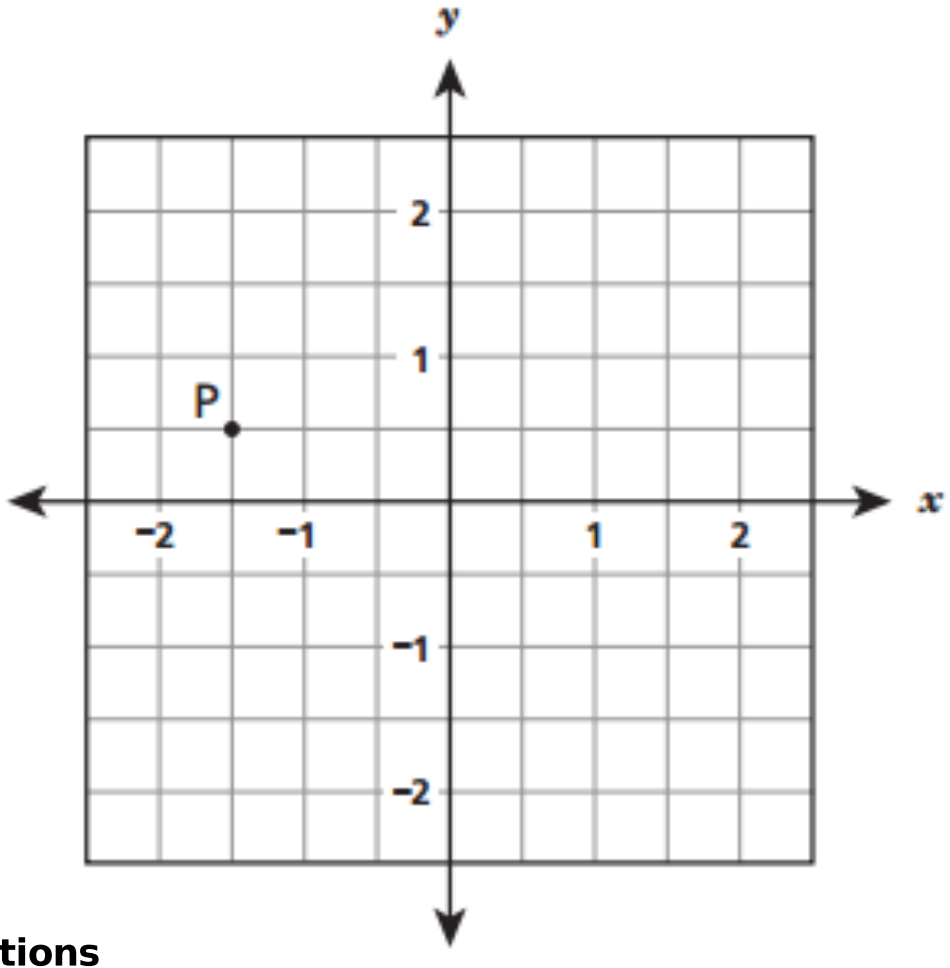


Answer

True

24 What is the x-coordinate of Point P on the coordinat
grid?

- A $-1\frac{1}{2}$
- B $-\frac{1}{2}$
- C $\frac{1}{2}$
- D $1\frac{1}{2}$



Answer

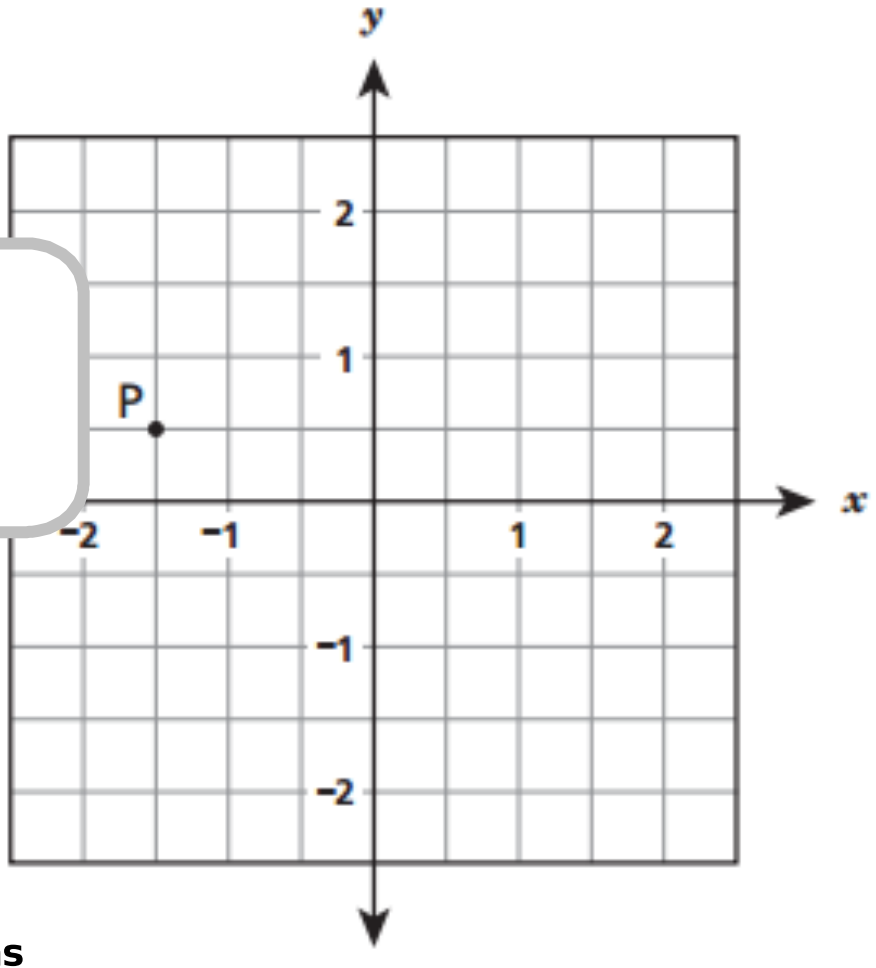
From NY Released Questions

24 What is the x-coordinate of Point P on the coordinat
grid?

- A $-1\frac{1}{2}$
- B $-\frac{1}{2}$
- C $\frac{1}{2}$
- D $1\frac{1}{2}$

Answer

A



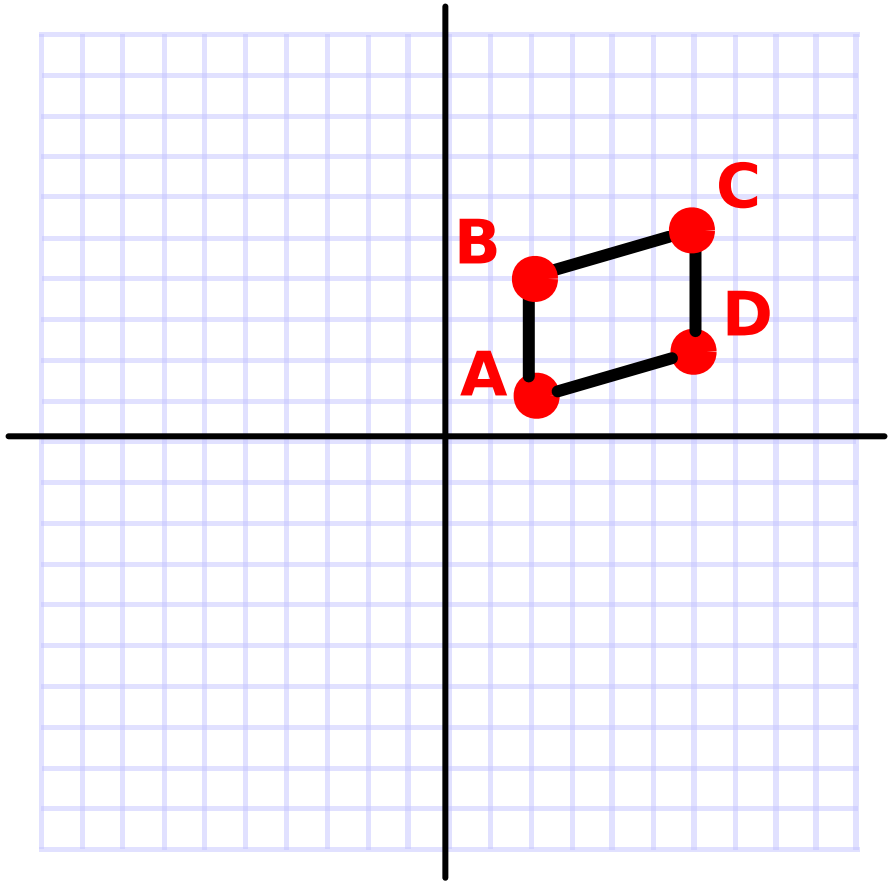
From NY Released Questions

Polygons in the Coordinate Plane

Return to Table of Contents

Polygons

We can use coordinates as **vertices**, and connect the dots to draw polygons on a coordinate plane.



Polygons

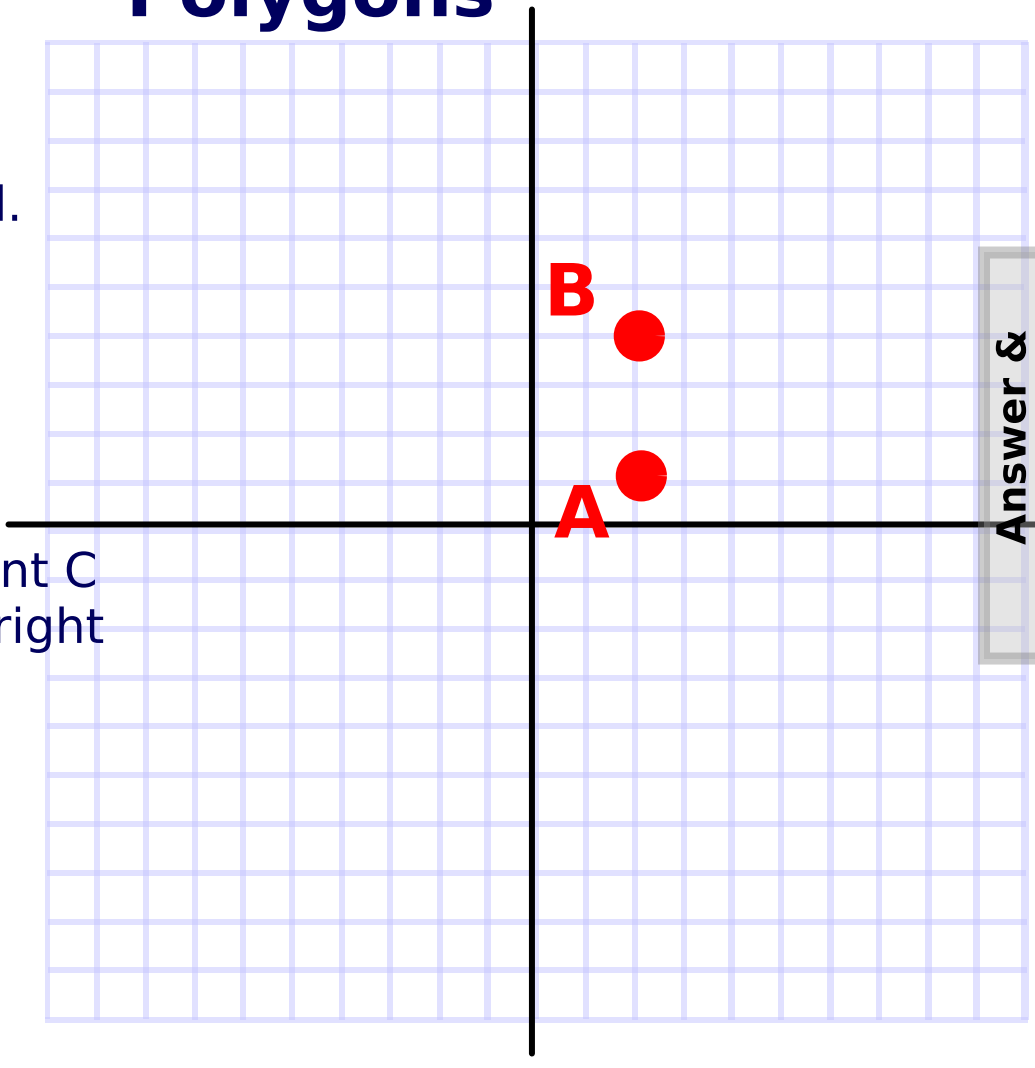
Point A and point B have been plotted.

A (2, 1)
B (2, 4)

List 4 possible coordinates for point C that would form a right triangle.

Plot point C to check.

C



Answer & Math Practice

Polygons

Point A and point
have been plo

A (2, 1)
B (2, 4)

List 4 possible
coordinates fo
that would for
triangle.

Plot point C
to check.

C

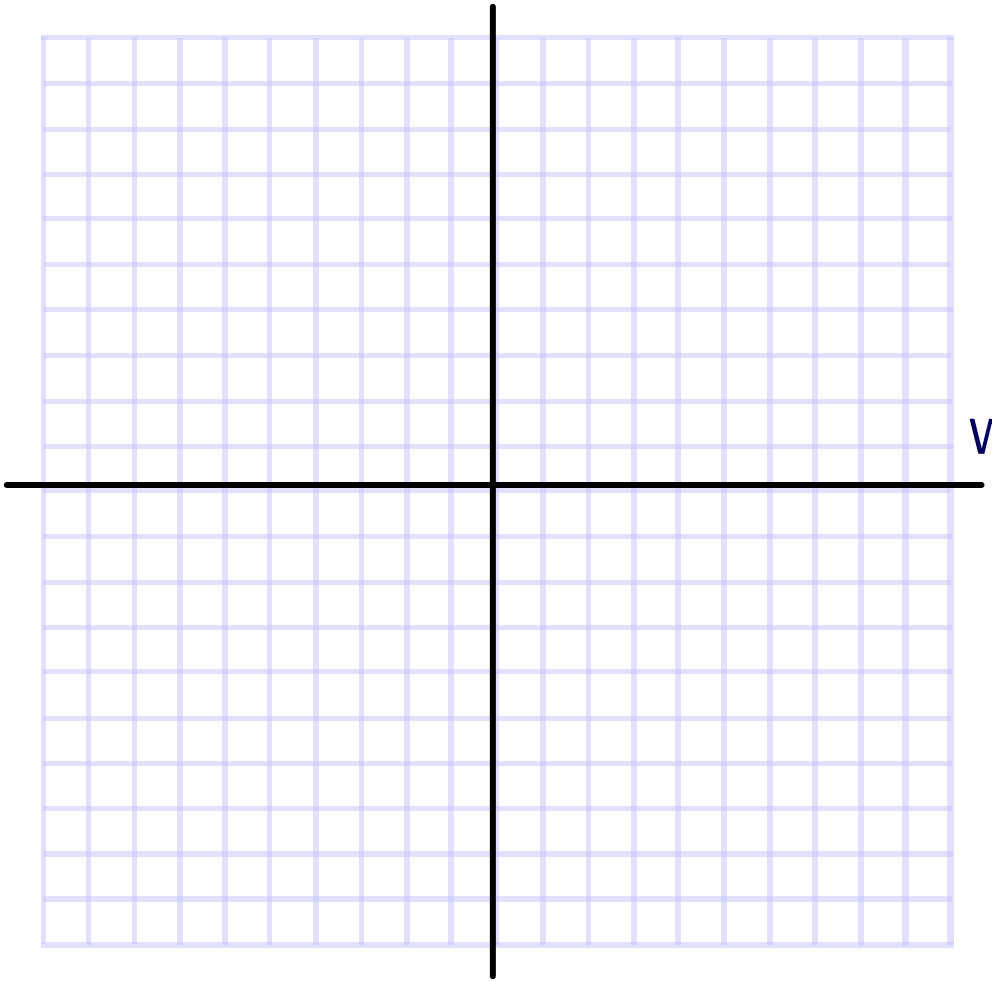
Answer & Math Practice

Any point on the coordinate plane that has a y-coordinate of 1 or 4.
e.g. (0, 1) or (4, 4)

MP.3: Construct viable arguments and critique the reasoning of others

Ask: How can you prove that your answer is correct?
How is your answer similar/different from _?

Polygons



Plot and label the following points:

H (4,3)
I (0, 3)
J (4, 0)

What 4th point would form rectangle HIJK?

Answer

(Drag to plot)

Polygons

Answer

H (4,3)
I (0, 3)
J (4, 0)

K = (0,0)

abel the
points:

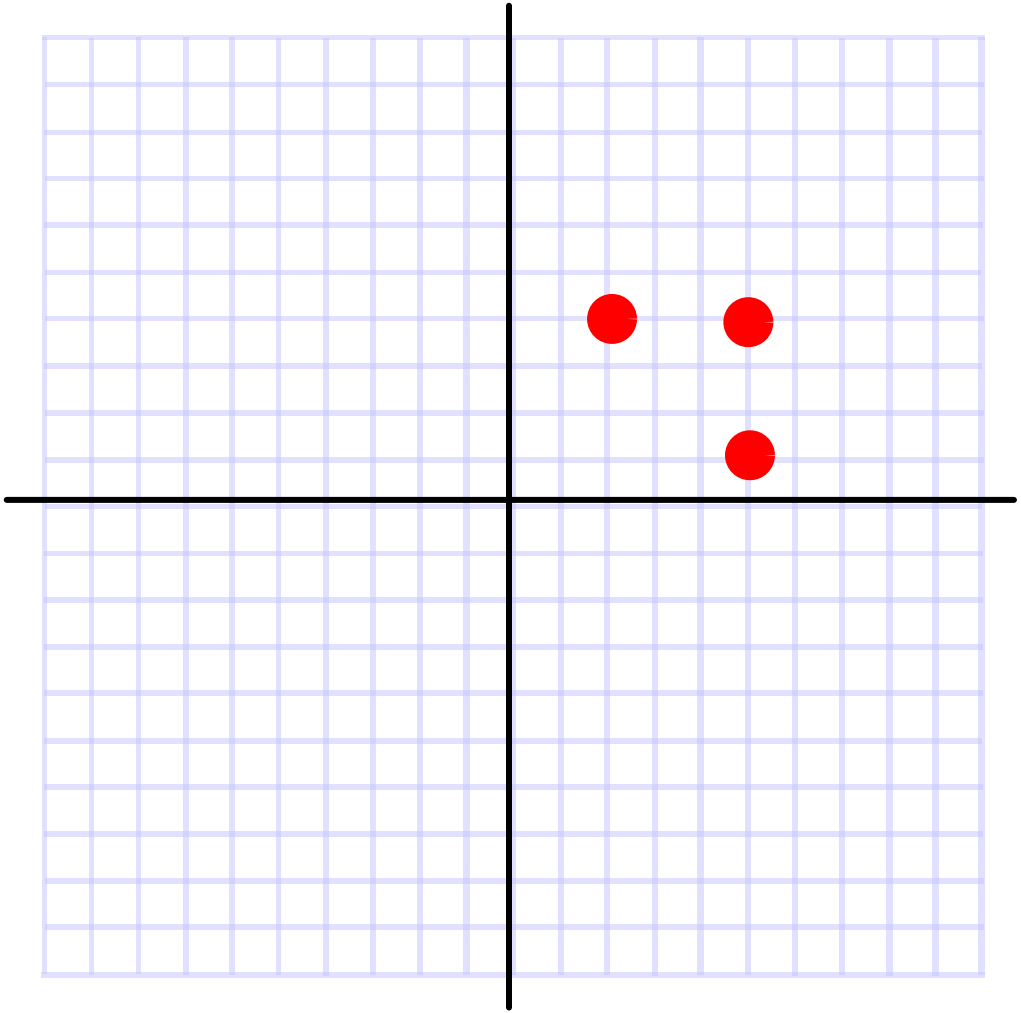
3)
3)
0)

oint would form
gle HIJK?

(Drag to plot)

25

- A (3, 2)
- B (5, 1)
- C (2, 1)
- D (1, 2)



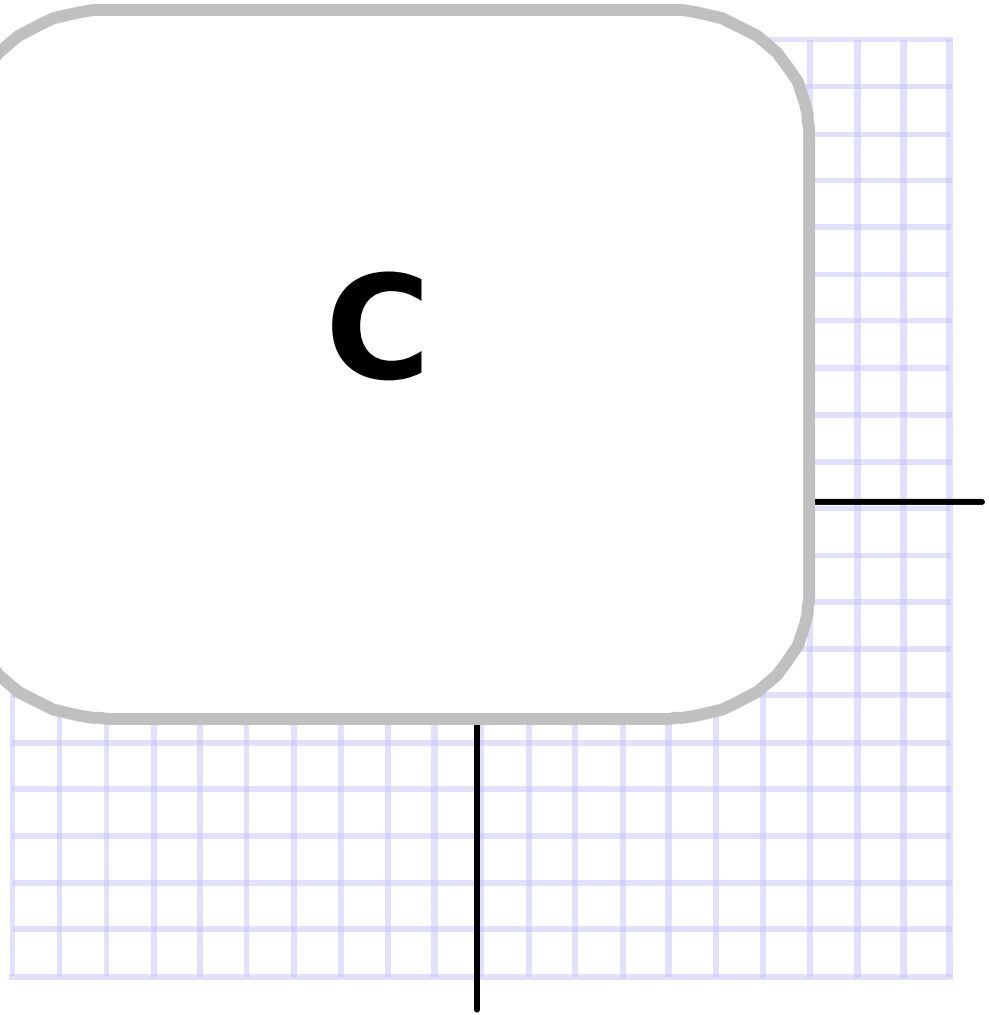
Answer

25

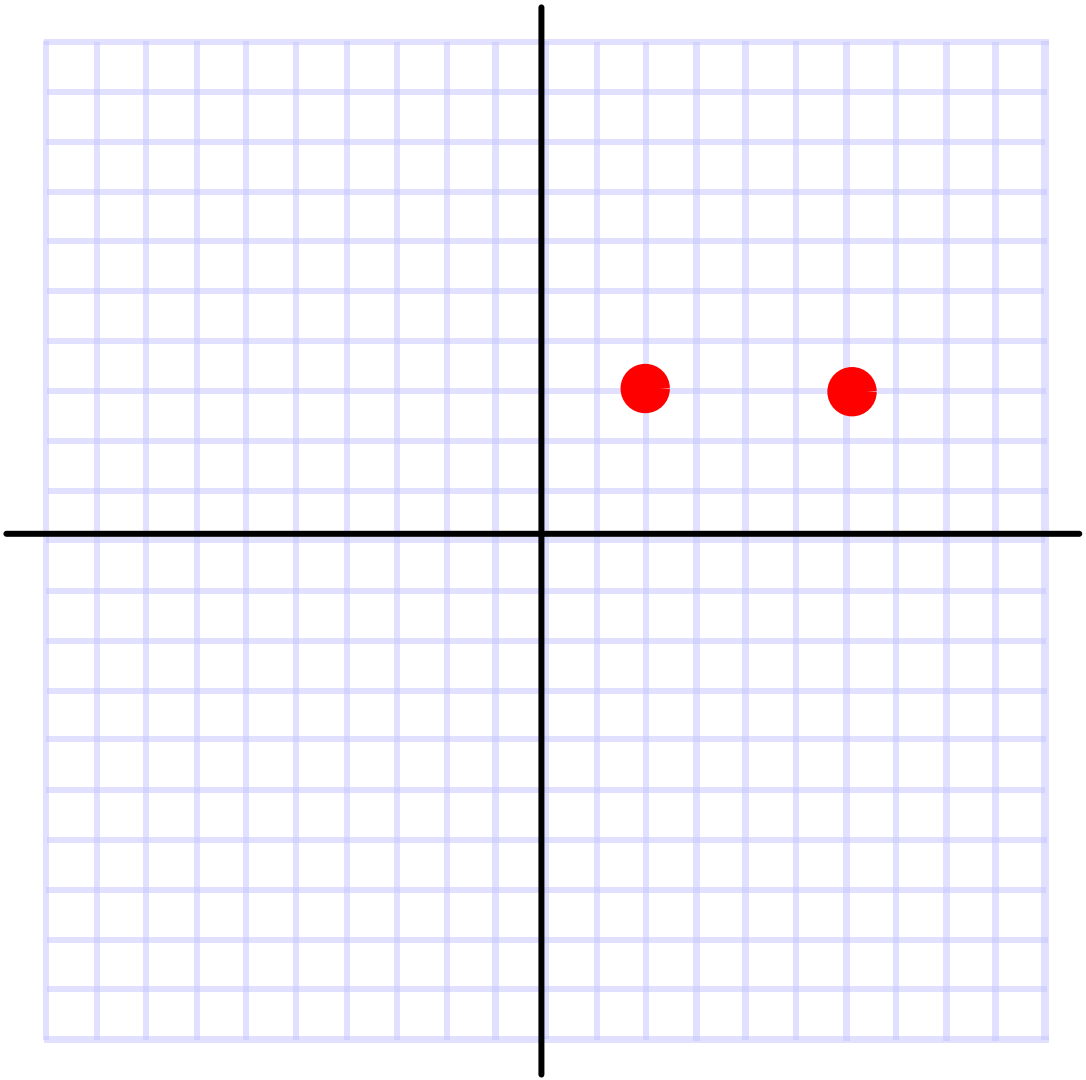
- A (3, 2)
- B (5, 1)
- C (2, 1)
- D (1, 2)

Answer

C



26



A (1, 4)

B (4, 1)

C (3, 4)

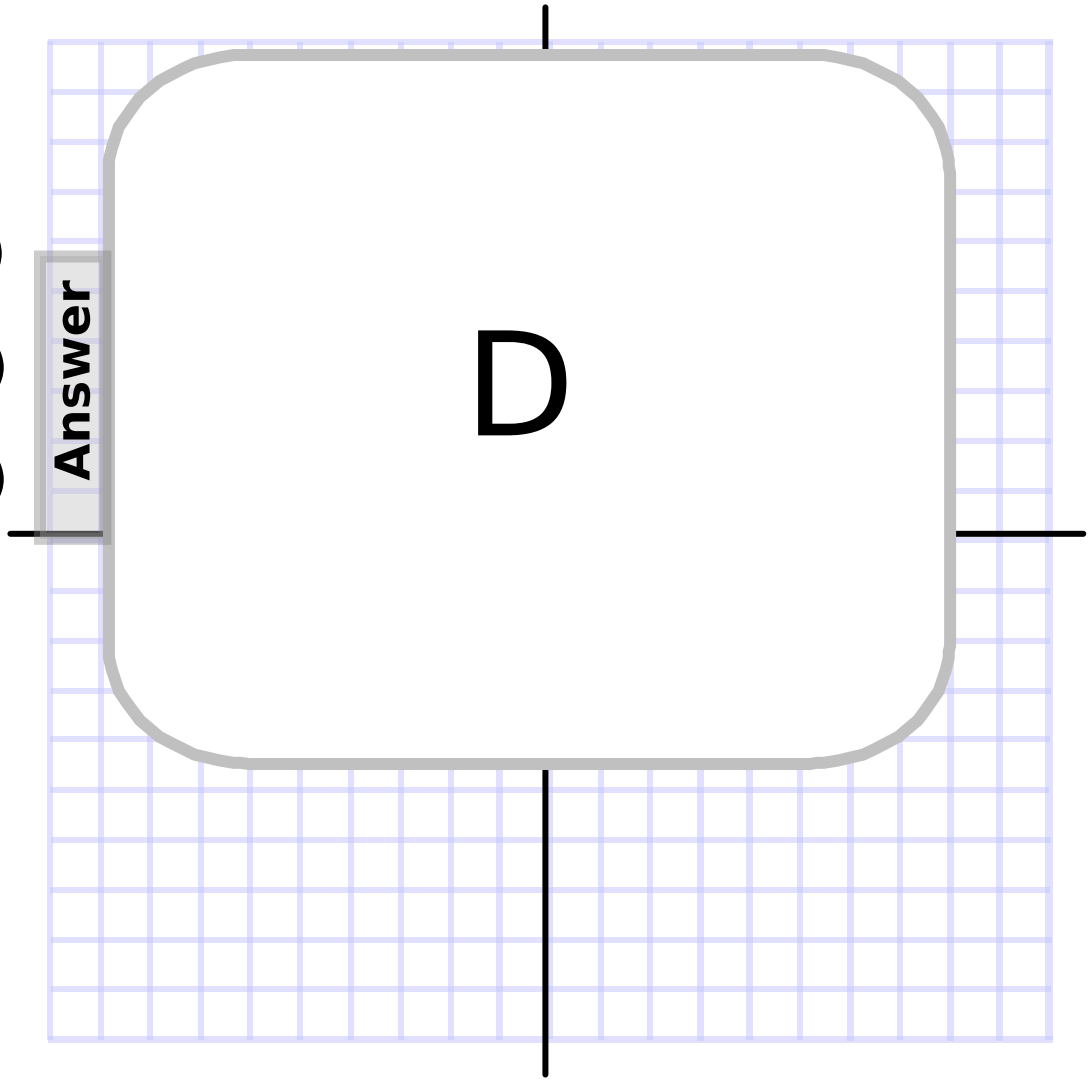
D (2, 1)

Answer

26

- A (1, 4)
- B (4, 1)
- C (3, 4)
- D (2, 1)

Answer



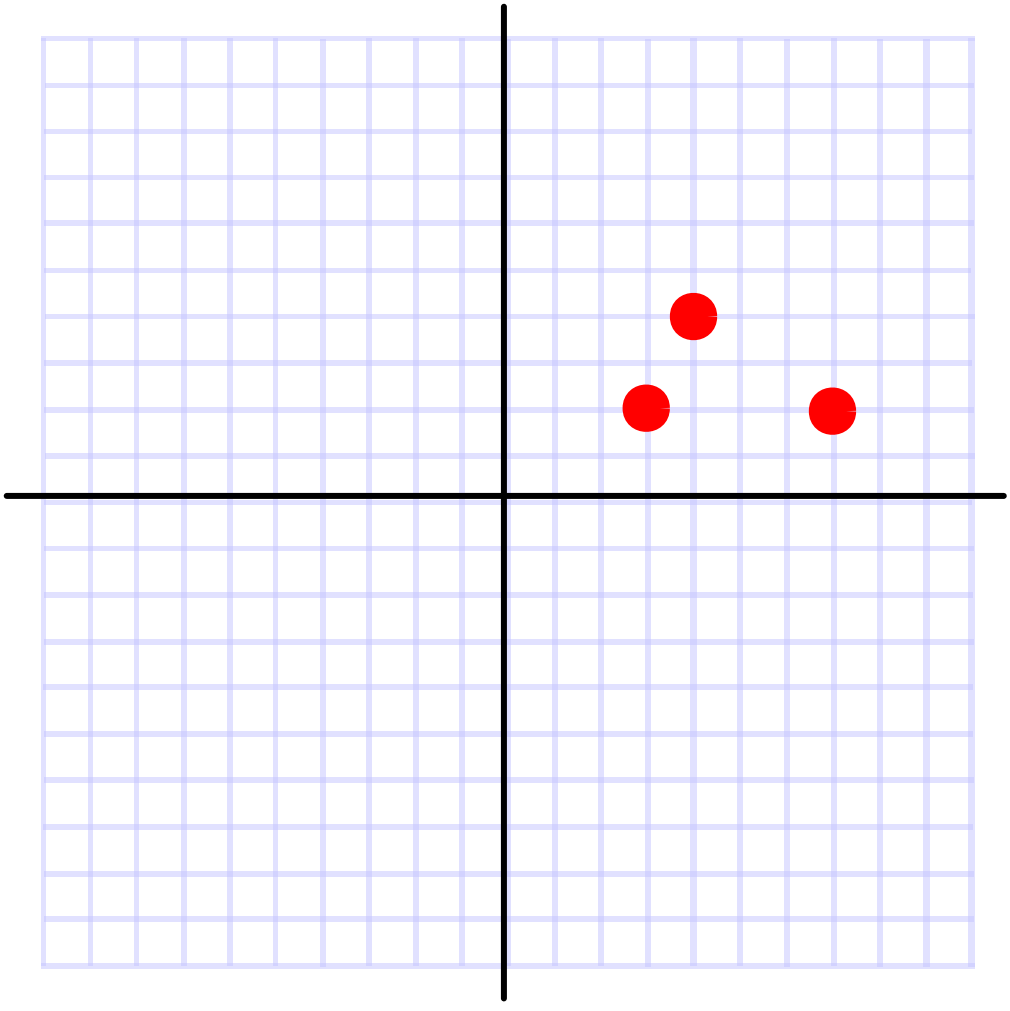
27

A (4, 8)

B (8, 4)

C (9, 5)

D (7, 4)



Answer

27

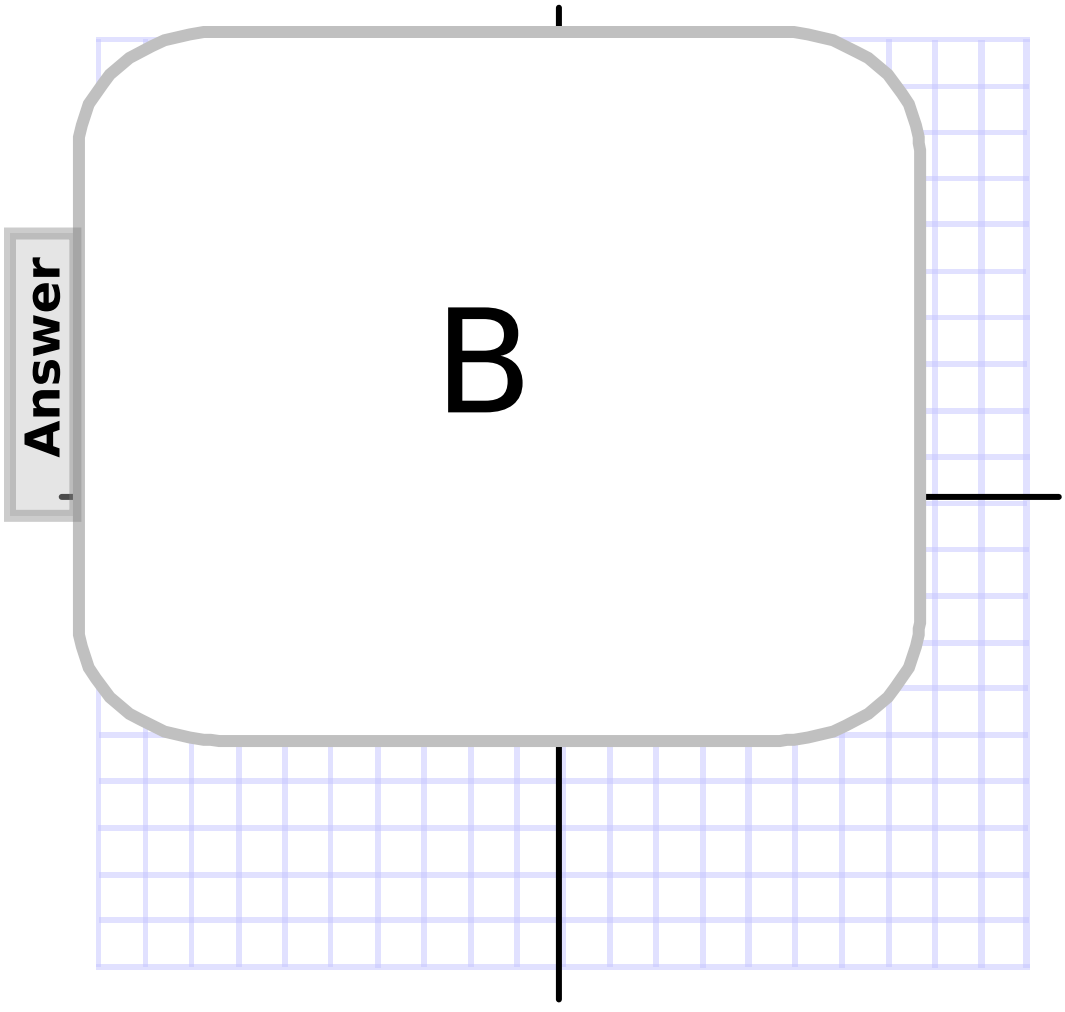
A (4, 8)

B (8, 4)

C (9, 5)

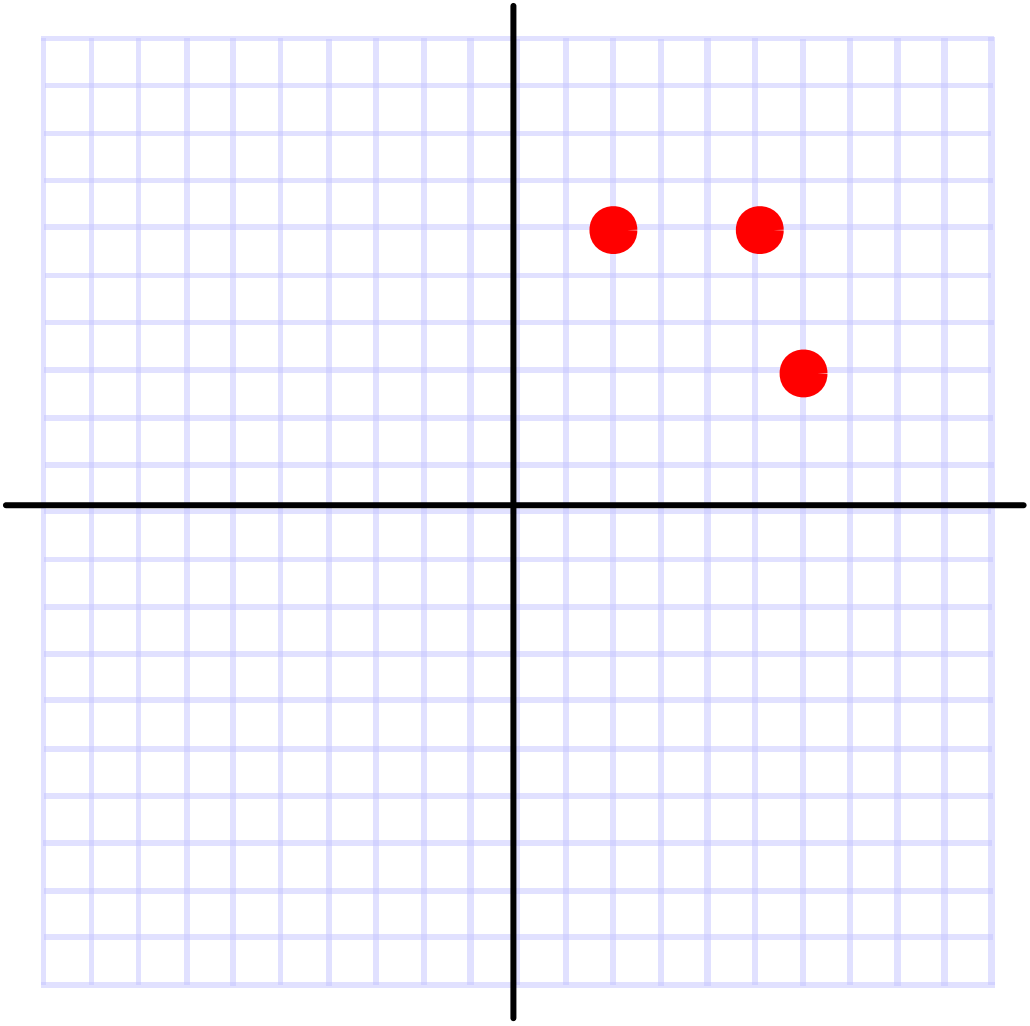
D (7, 4)

Answer



28

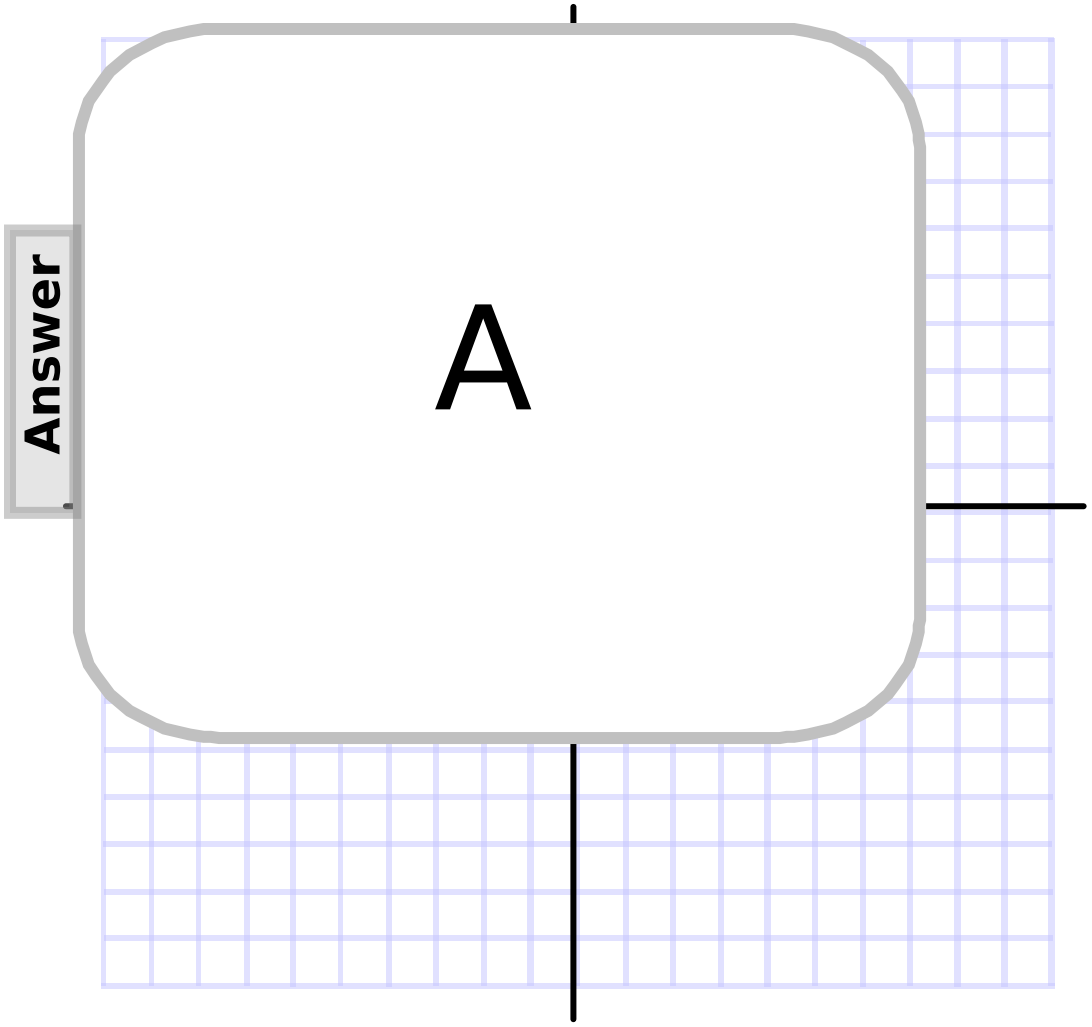
- A (1, 3)
- B (1, 1)
- C (3, 3)
- D (3, 1)



Answer

28

- A (1, 3)
- B (1, 1)
- C (3, 3)
- D (3, 1)



29 Three vertices of rectangle PQRS are P(3, 2), Q(3, -3
and R(0, -3). What are the coordinates of vertex S.

- (2, 0)
- (-2, 0)
- (0, 2)
- (-3, 0)

Answer

29 Three vertices of rectangle PQRS are P(3, 2), Q(3, -3) and R(0, -3). What are the coordinates of vertex S.

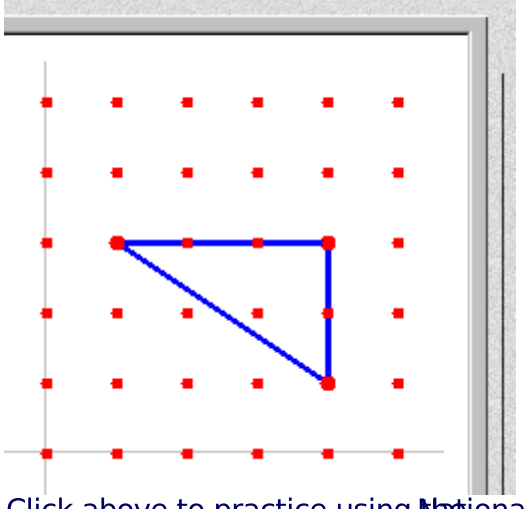
- (2, 0)
- (-2, 0)
- (0, 3)
- (-3, 0)

Answer

C

Coordinate Grid Geoboards Activity

- Work in partners.
- One partner creates a polygon on the geoboard and writes down the vertices.
- Other partner plots the points, and connects them with line segments.
- Compare the polygons, then switch roles.



This example, the vertices are:

(1, 3)

(4, 1)

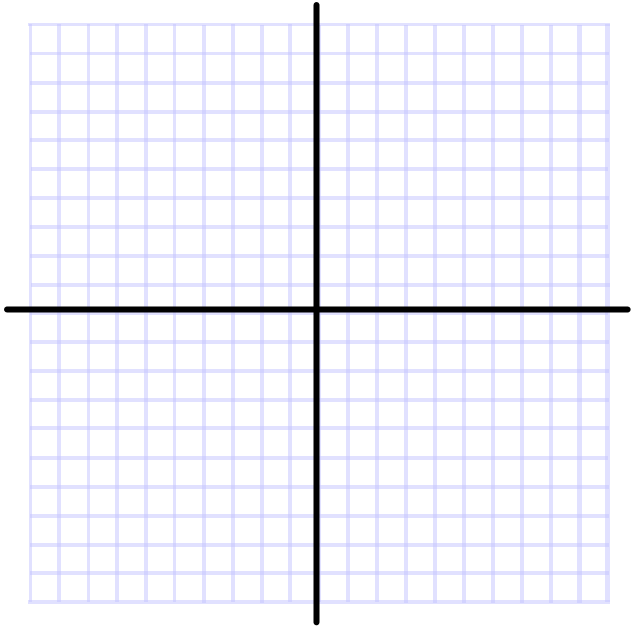
(4, 3)

Click above to practice using the National Library of Virtual Manipulatives web site.

Length of Each Side

Plot the following points and connect them in the order given. Use the coordinates to find the length of each side.

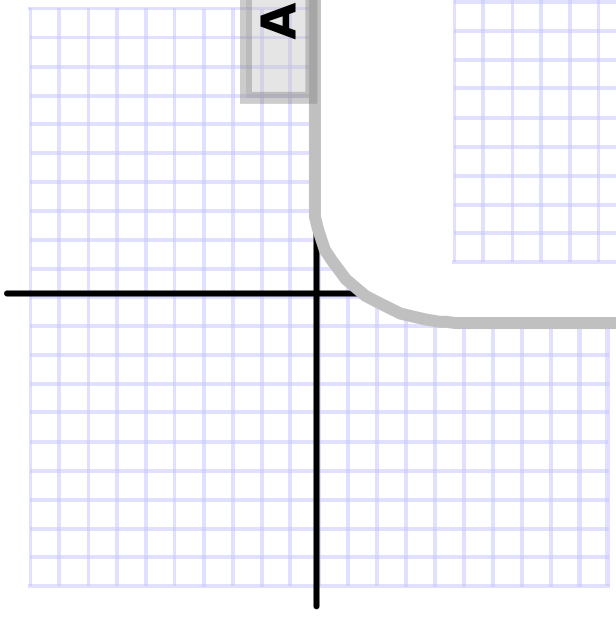
A (4, 2) B (-2, 2) C (-2, -2) D (4, -2)



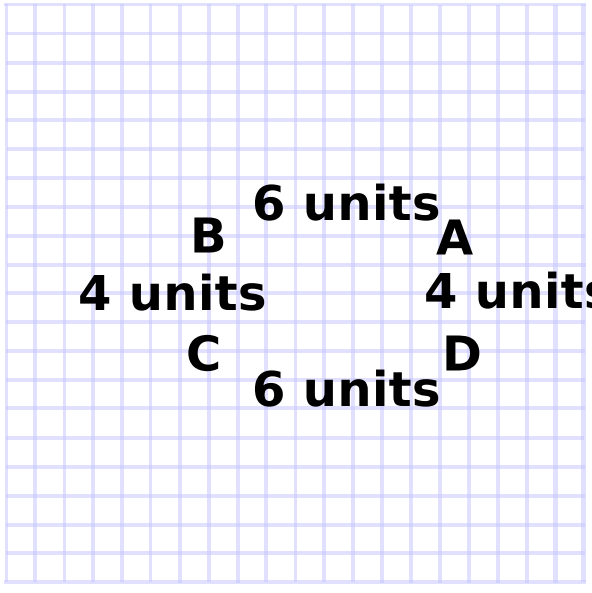
Answer

Length of Each Side

Plot the follo egiven. Use the coordina)



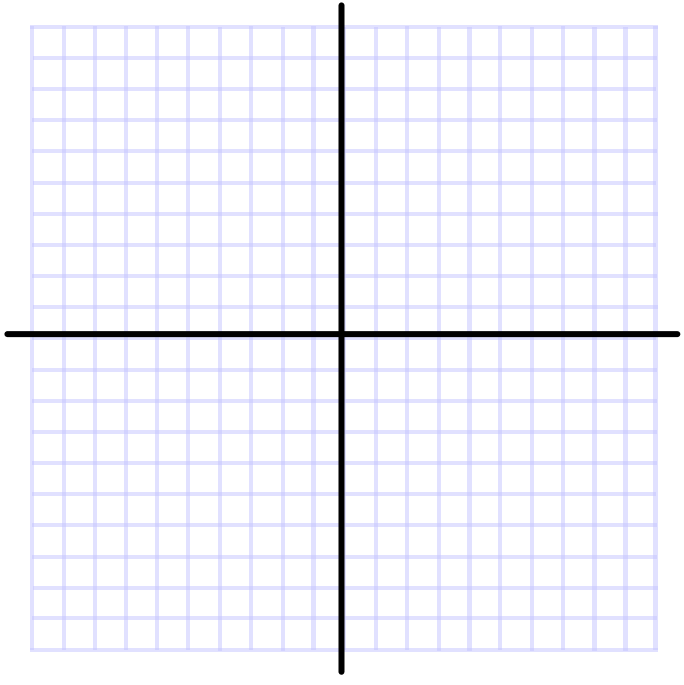
Answer



Length of Each Side

Plot the following points and connect them in the order given.
Use the coordinates to find the length of side $\overline{CD}$.

A (6, 8) B (-3, 8) C (-3, -1) D (6, -1)



Answer

Length of Each Side

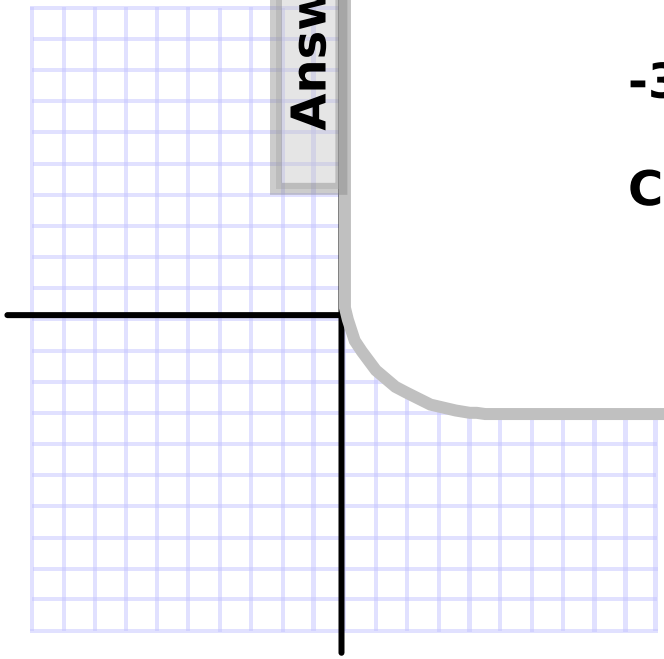
Plot the follo… in the given.
Use the co… CD.

Answer

C (-3, -1)
D (6, -1)

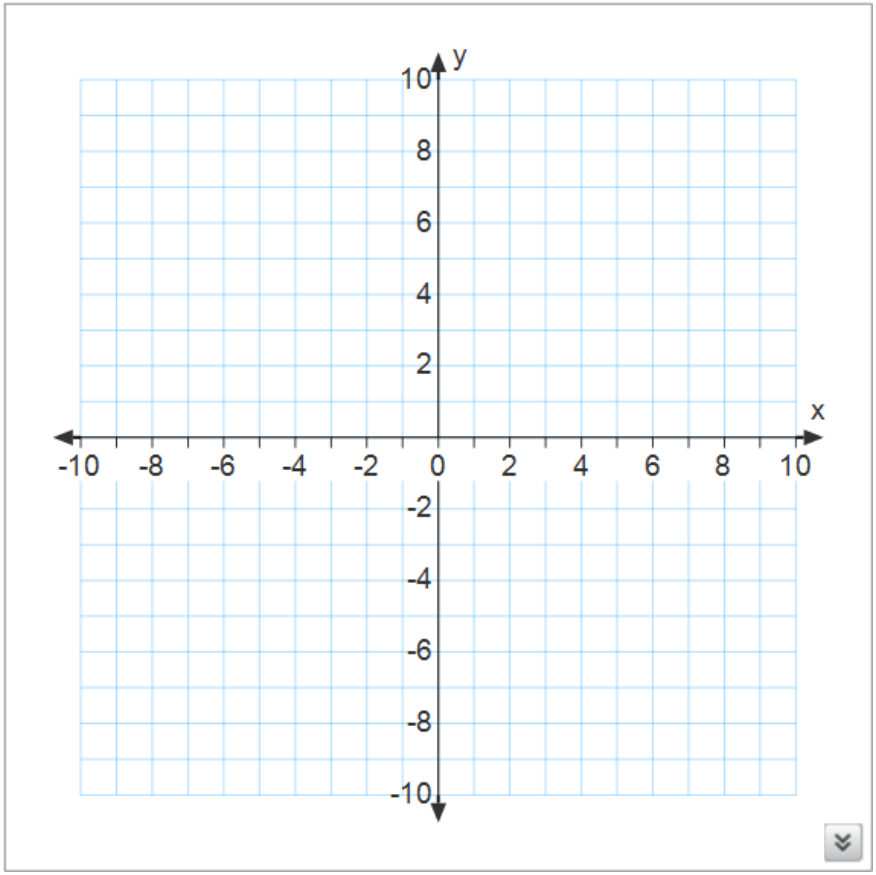
-3 + 6 = 9 units

CD = 9 units



30 Plot the following points and connect them in the or
given. What is the length of $\overline{AD}$?

A (-1, -2) B (-5, -2) C(-2, -4) D(-1, -4)



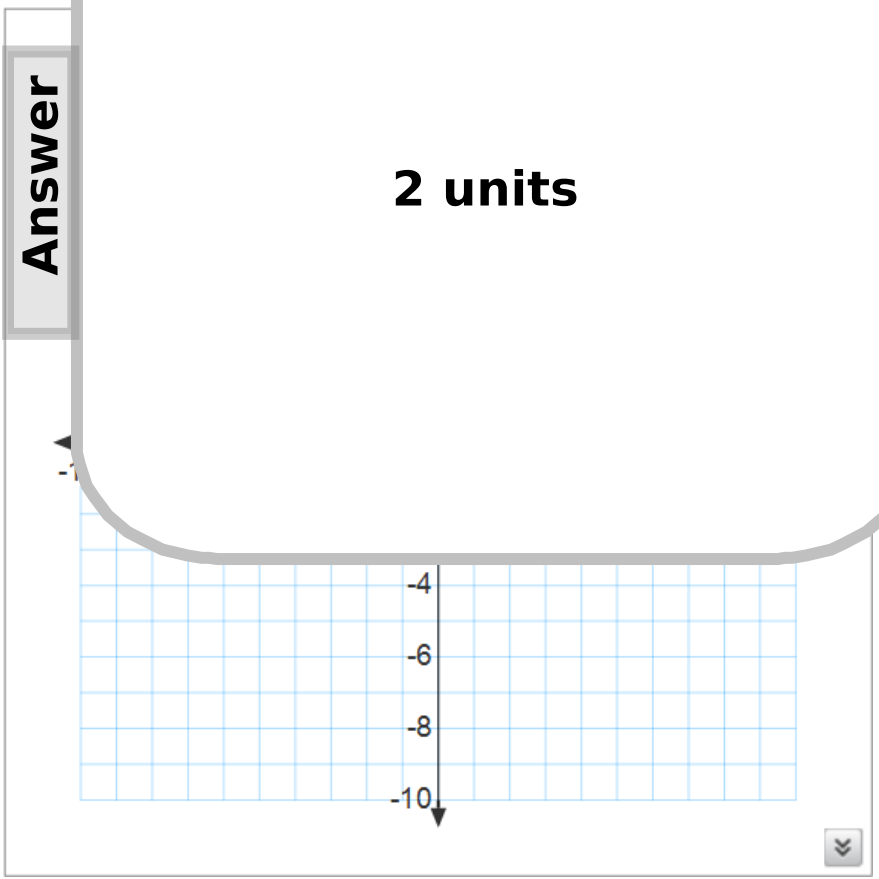
Answer

30 Plot the following points and connect them in the or
given. What is the length of $\overline{AD}$?

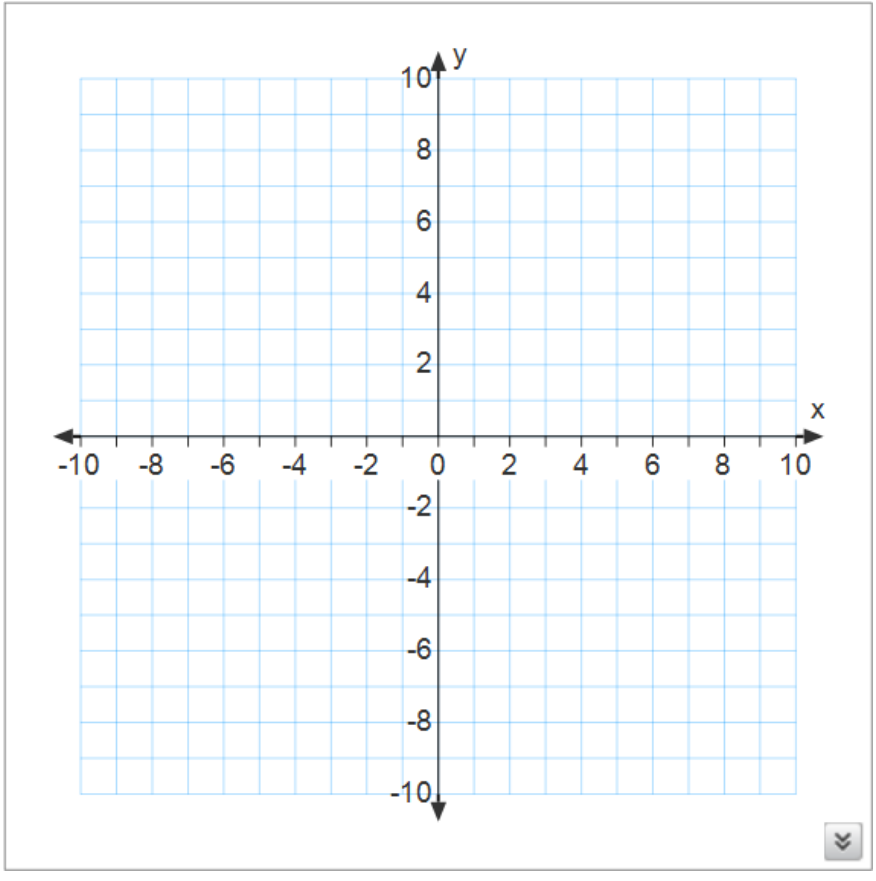
-1, -4)

Answer

2 units

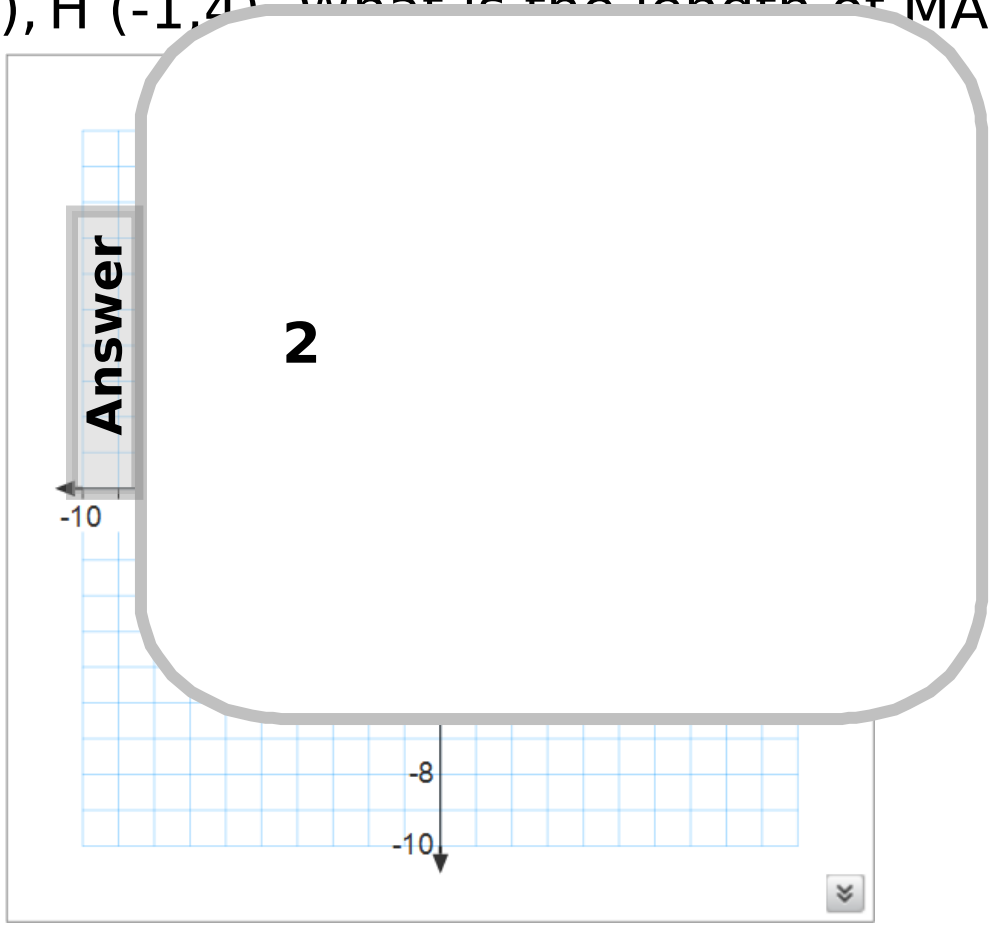


31 Plot and connect the following points: M(1,2), A(-1,2
(1,4), H (-1,4). What is the length of $\overline{MA}$?

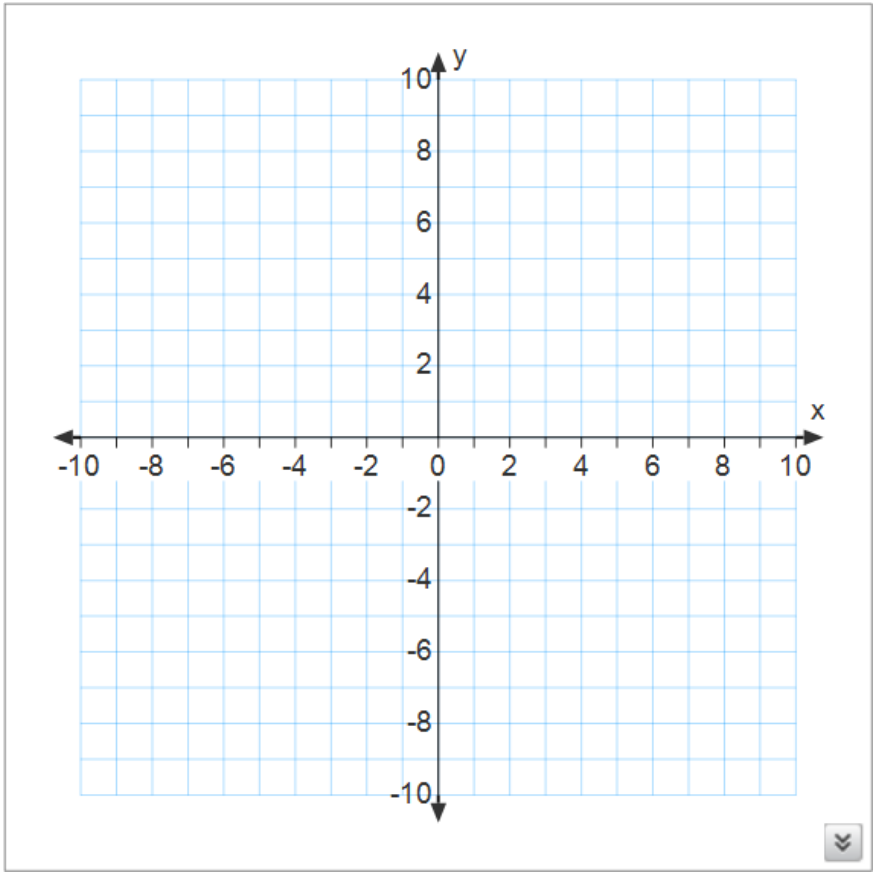


Answer

31 Plot and connect the following points: M(1,2), A(-1,2
(1,4), H (-1,4). What is the length of $\overline{MA}$?

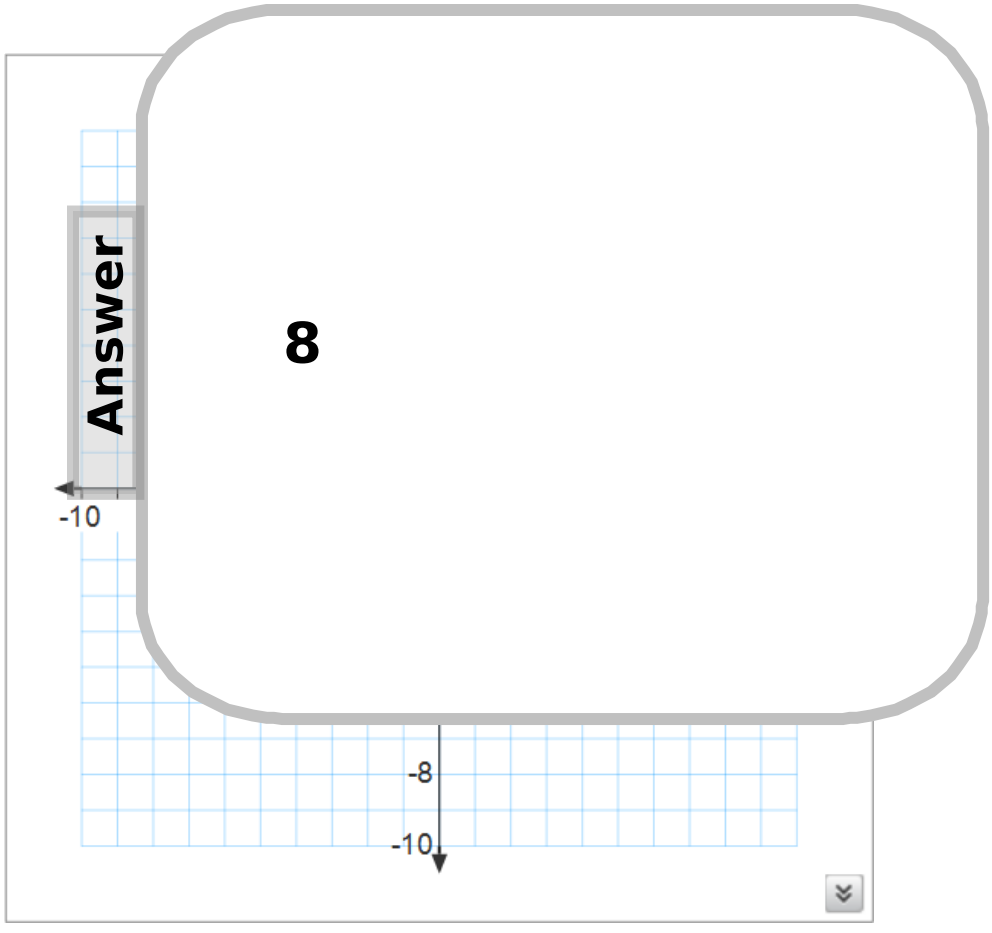


32

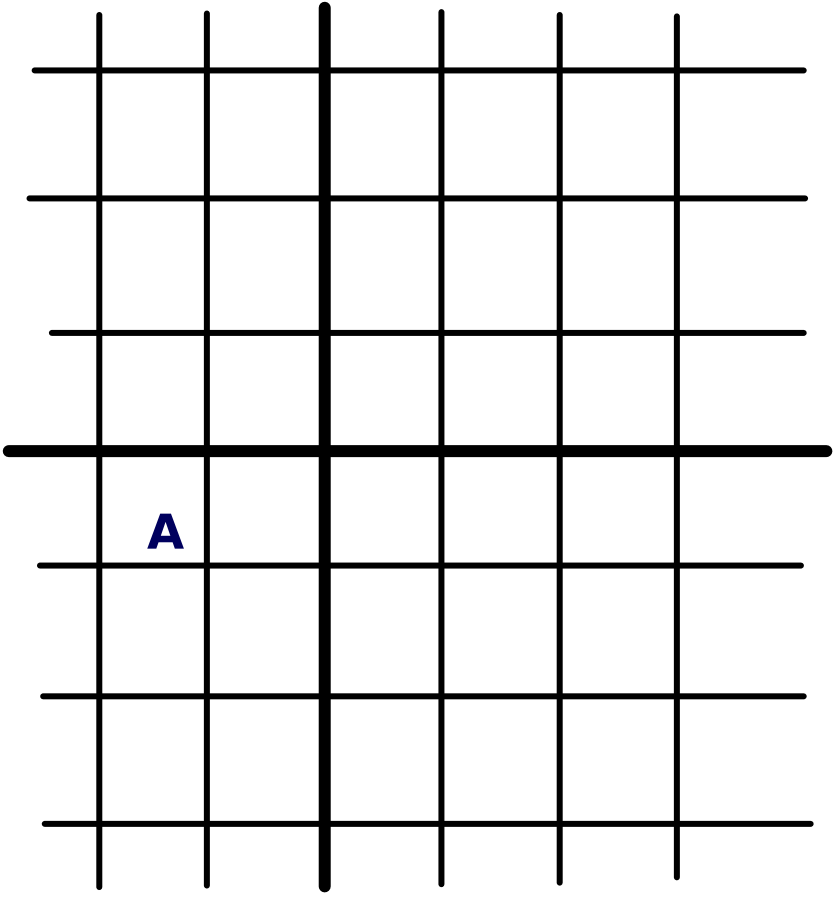


Answer

32



Help Sarah make a map of her town by plotting the buildings correctly. Her house (point A) is 2 units West and one unit South of the school (point B). Town Hall (point C) is 3 units South of the school. The library (point D) forms parallelogram ABCD.



B

C

D

What can be said about the distance between the school and Sarah's house, and the distance between the library and Town Hall?

Justify your answer.

Answer

What can be said about the distance between the school and S
between th

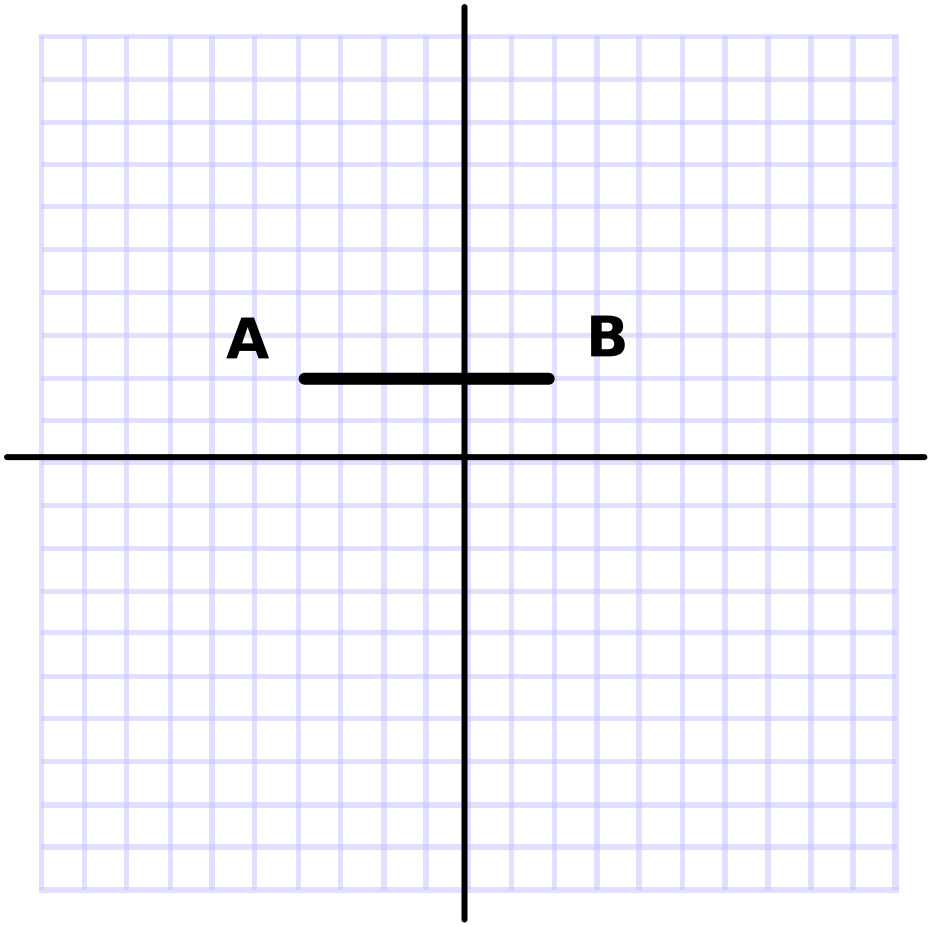
Justify your

Answer

They are the same distance apart, because opposite sides of a parallelogram are congruent.

33 $\overline{AB}$ is one side of right triangle ABC. In the triangle, angle A is the right angle, and the length of side AC is 5 u
Choose all the possible coordinates for vertex C.

- ☐ (-4, 7)
- ☐ (2, 7)
- ☐ (-4, -3)
- ☐ (2, -3)



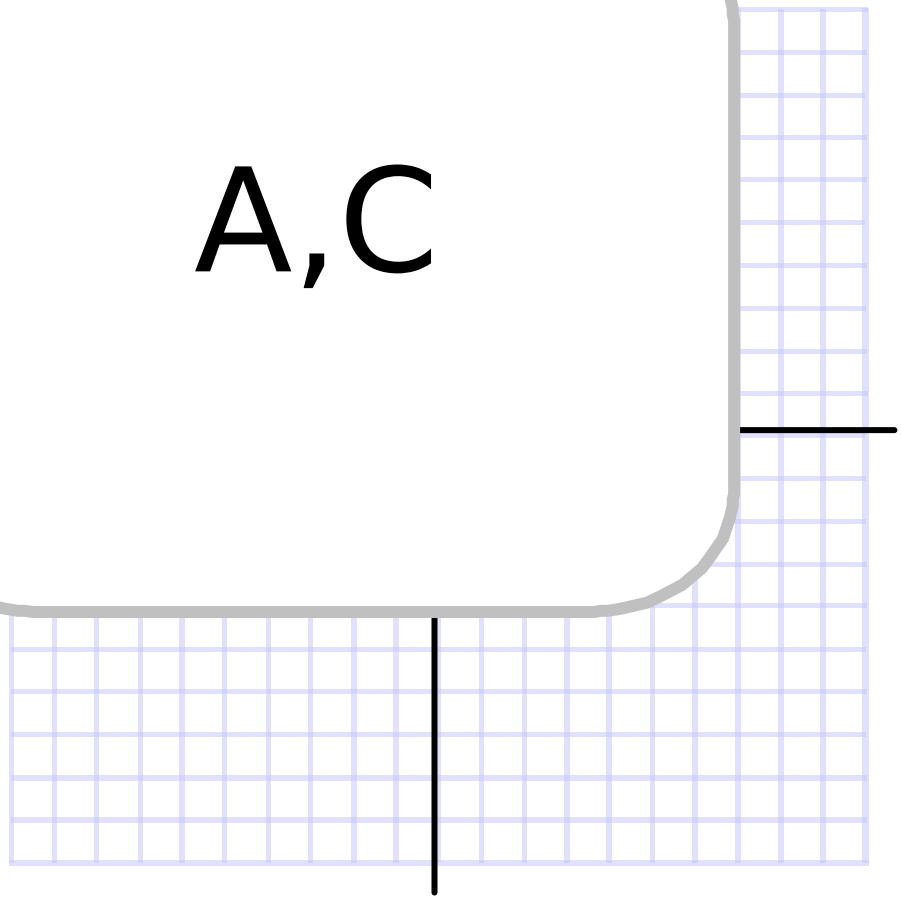
Answer

33 $\overline{AB}$ is one side of right triangle ABC. In the triangle, angle A is the right angle, and the length of side $\overline{AC}$ is 5 u
Choose all t er vertex C.

- ☐ (-4, 7)
- ☐ (2, 7)
- ☐ (-4, -
- ☐ (2, -3)

Answer

A,C



Cartesian Plane Applications

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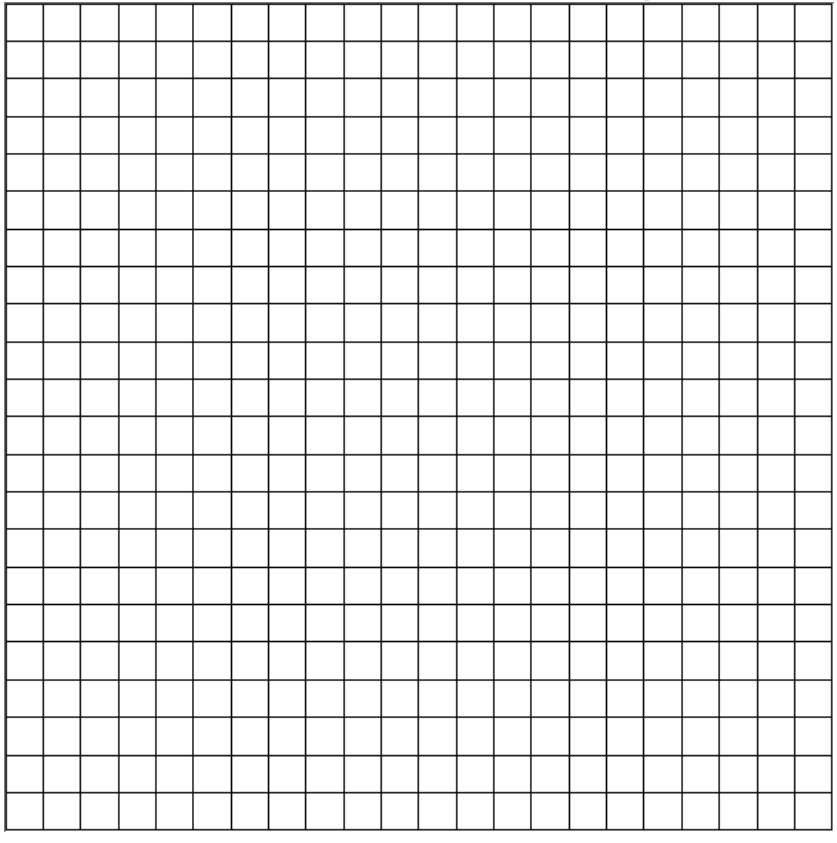
Navigation Application

Four friends are touring on motorcycles. They come into an intersectio
of two roads; the road they are on continues straight, and the
perpendicular to it. The sign
the intersection shows the
distances to several towns.
Label the roads on the map
Then, use the map answer
the following questions.



Derived from engage^ny

Teacher Notes

Navigation Application

Four friends are touring on motorcycles. They come to an intersectio
of two roads; the road they are on continues straight, and the
perpendicular to it. The sign
the intersection shows the
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Label the roads on the map
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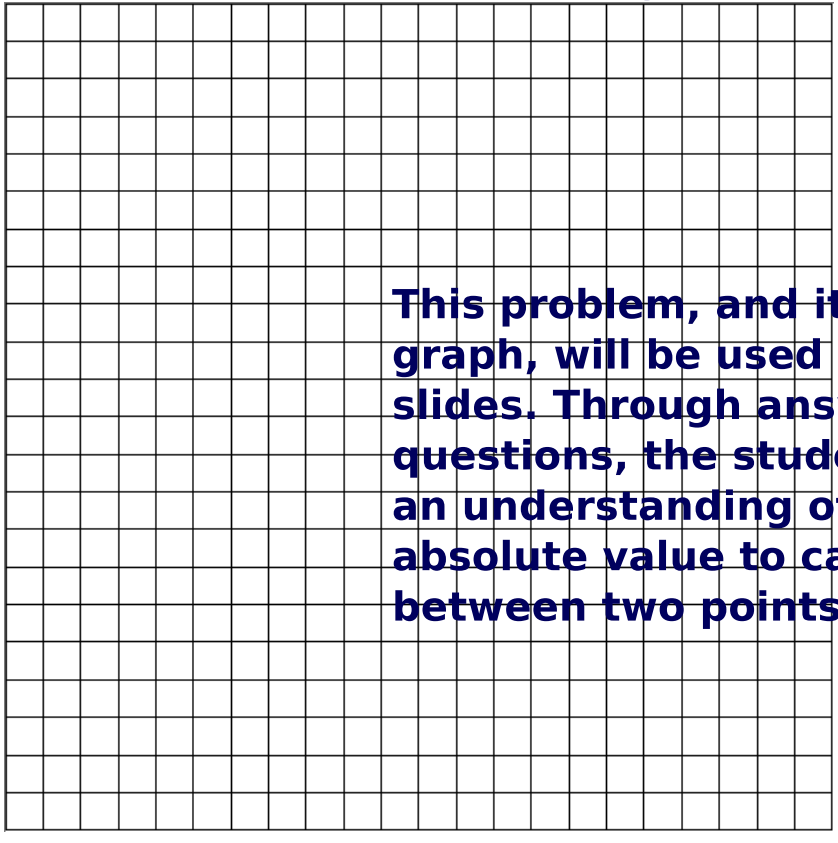
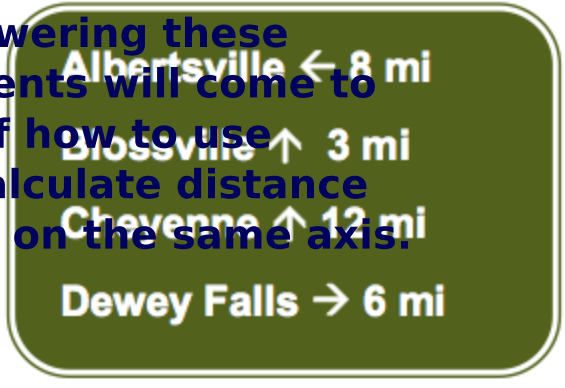


This problem, and its completed graph, will be used for the next 4 slides. Through answering these questions, the students will come to an understanding of how to use absolute value to calculate distance between two points on the same axis.



Derived from engage^ny

Navigation Solution

Click to Reveal

Think, Pair, Share

What is the distance between Albertsville and Dewey Falls?

Click to Reveal

s

Click to reveal answer

Teacher Notes

on

ar

Think, Pair, Share

What is the distance between Albertsville and Dewey Falls?

Allow the students 30 sec to work on the problem, 30 seconds to discuss it with a neighbor, then discuss it as a class.

Click to reveal

MP.4: Model with mathematics

Ask: What do you already know about solving this problem?
Write a number sentence to describe this situation.
What connections do you see?
Why do your results make sense?

Click to reveal answer

Think, Pair, Share

What is the distance between Blossville and Cheyenne?

Click to Reveal

ls

Click to reveal answer

Teacher Notes

Think, Pair, Share

What is the distance between Blossville and Cheyenne?

Click to Reveal

Allow the students 30 sec to work on the problem, 30 seconds to discuss it with a neighbor, then discuss it as a class.

Click to reveal answer

Think, Pair, Share

On the coordinate plane, what represents the x-axis is the intersection of the two roads?

Click to reveal answer

Teacher Notes

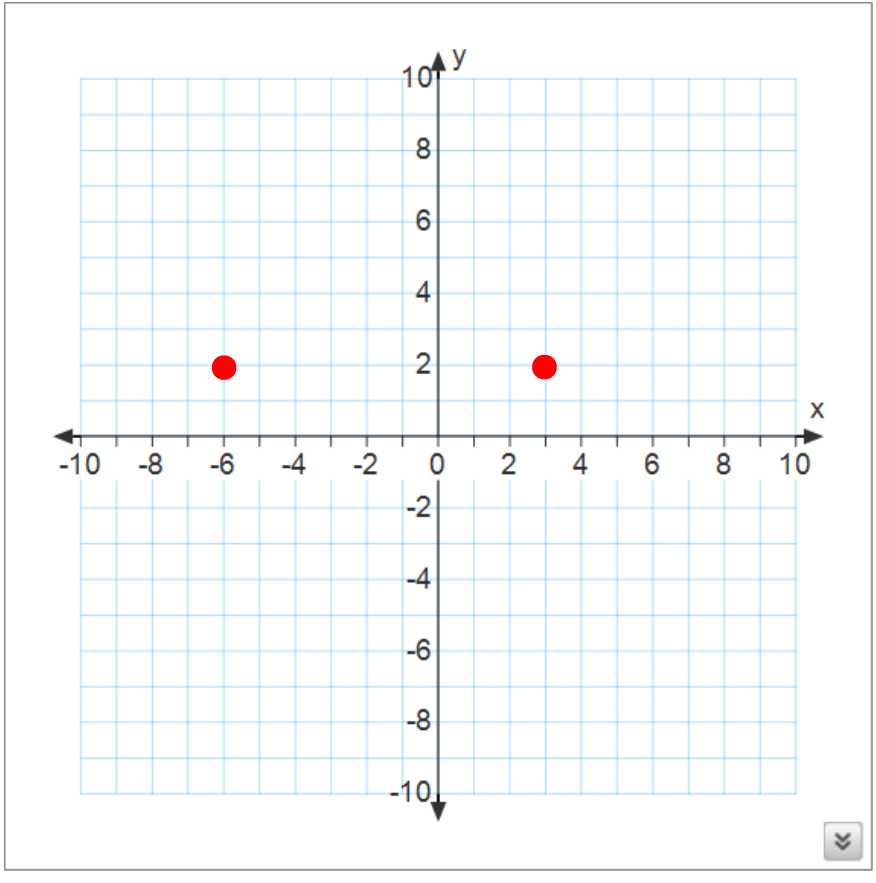
Think, Pair, Share

On the coordinate plane, what represents the intersection of the two roads?

Allow the students 30 sec to work on the problem, 30 seconds to discuss it with a neighbor, then discuss it as a class.

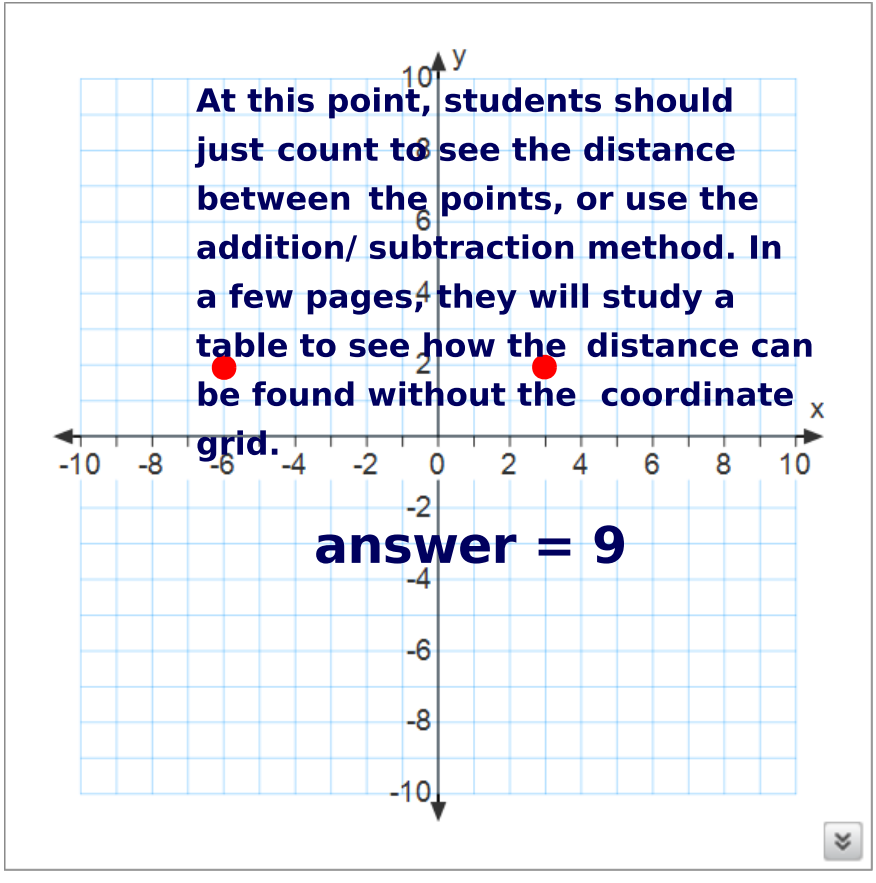
Click to reveal answer

34 The points (-6, 2) and (3, 2) are plotted below. What is the distance between these two points?

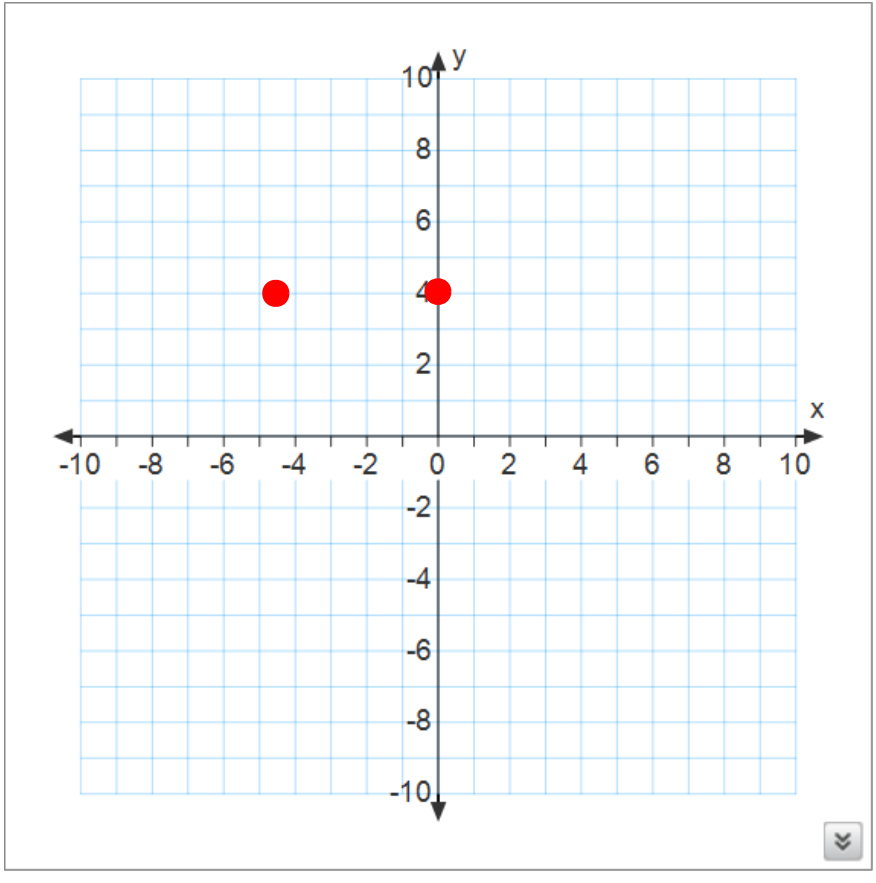


Teacher Notes

34 The points (-6, 2) and (3, 2) are plotted below. What is the distance between these two points?

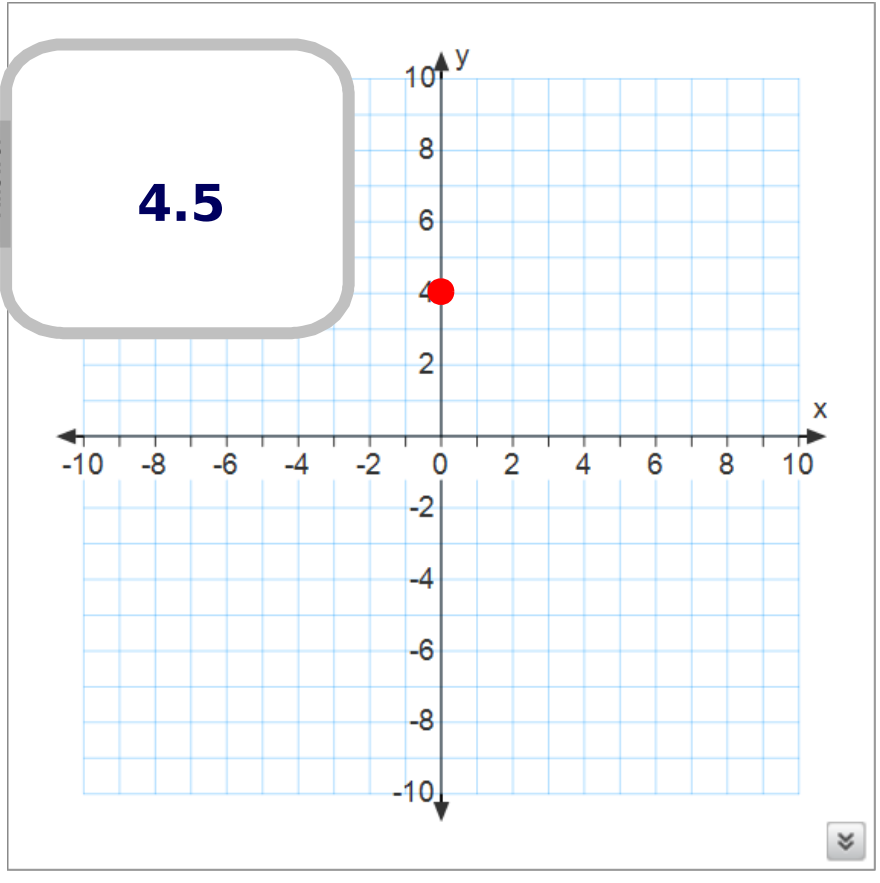


35 The points (-4.5, 4) and (0, 4) are plotted below. What is the distance between these two points?

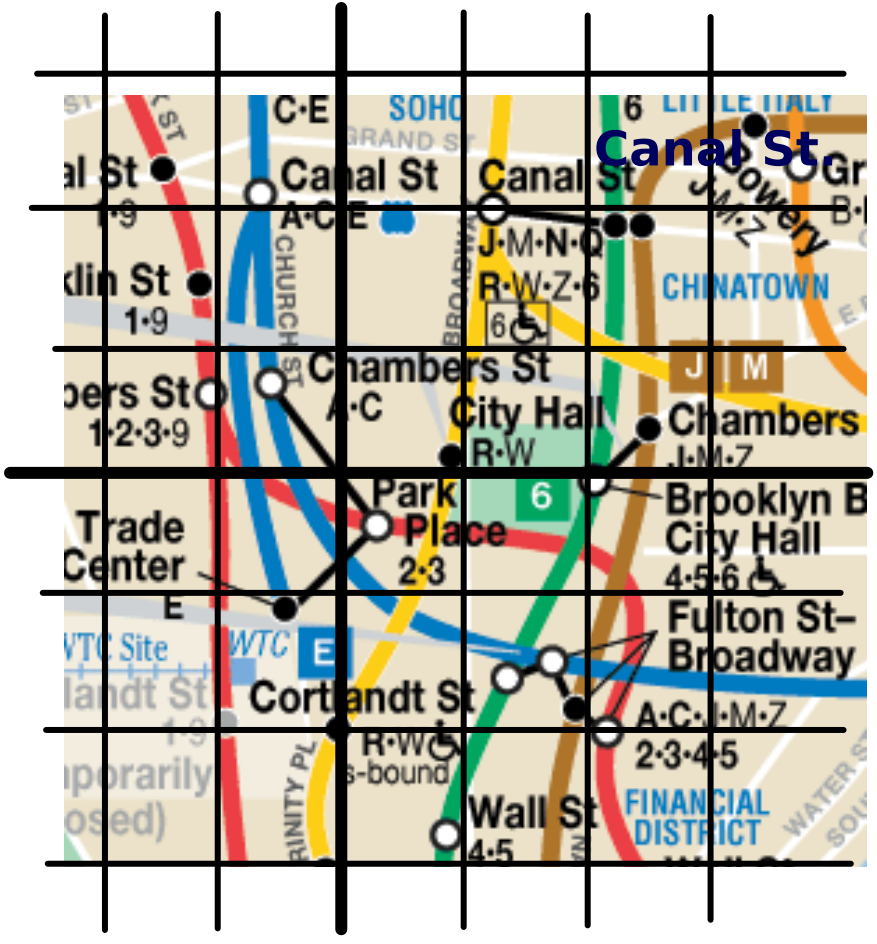


Answer

35 The points (-4.5, 4) and (0, 4) are plotted below. What is the distance between these two points?



36 The Canal St station is related to another station on the map. Its x-coordinate is the same as point mystery station's, but its y-coordinate is the opposite of the mystery station's. What are the coordinates of the mystery station?

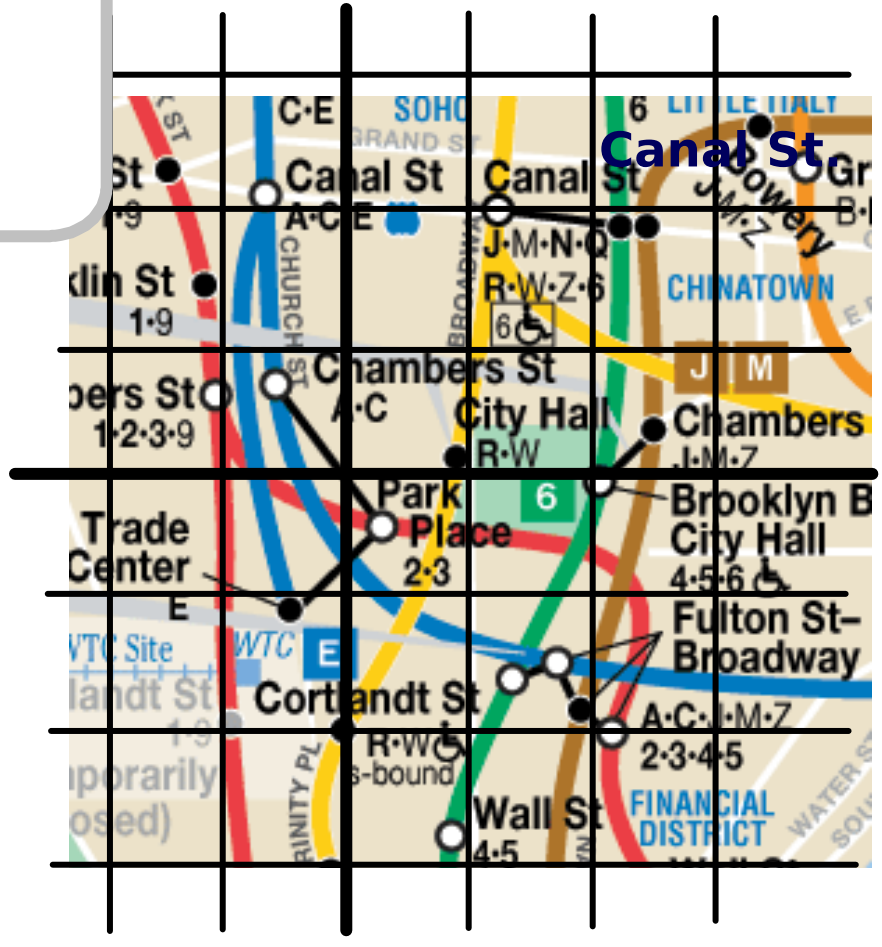


- A (0, 2)
- B (-2, 2)
- C (1, -3)
- D (2, -2)

36 The Canal St station is related to another station on the map. Its x-coordinate is the same as point mystery station's, but its y-coordinate is the opposite of the mystery st[illegible]at are the coordinates of the mystery s[illegible]

Answer

D



- A (0, 2)
- B (-2, 2)
- C (1, -3)
- D (2, -2)

Navigation Application

Find and plot the point at the following subway stops.

Canal St

(2, 2)

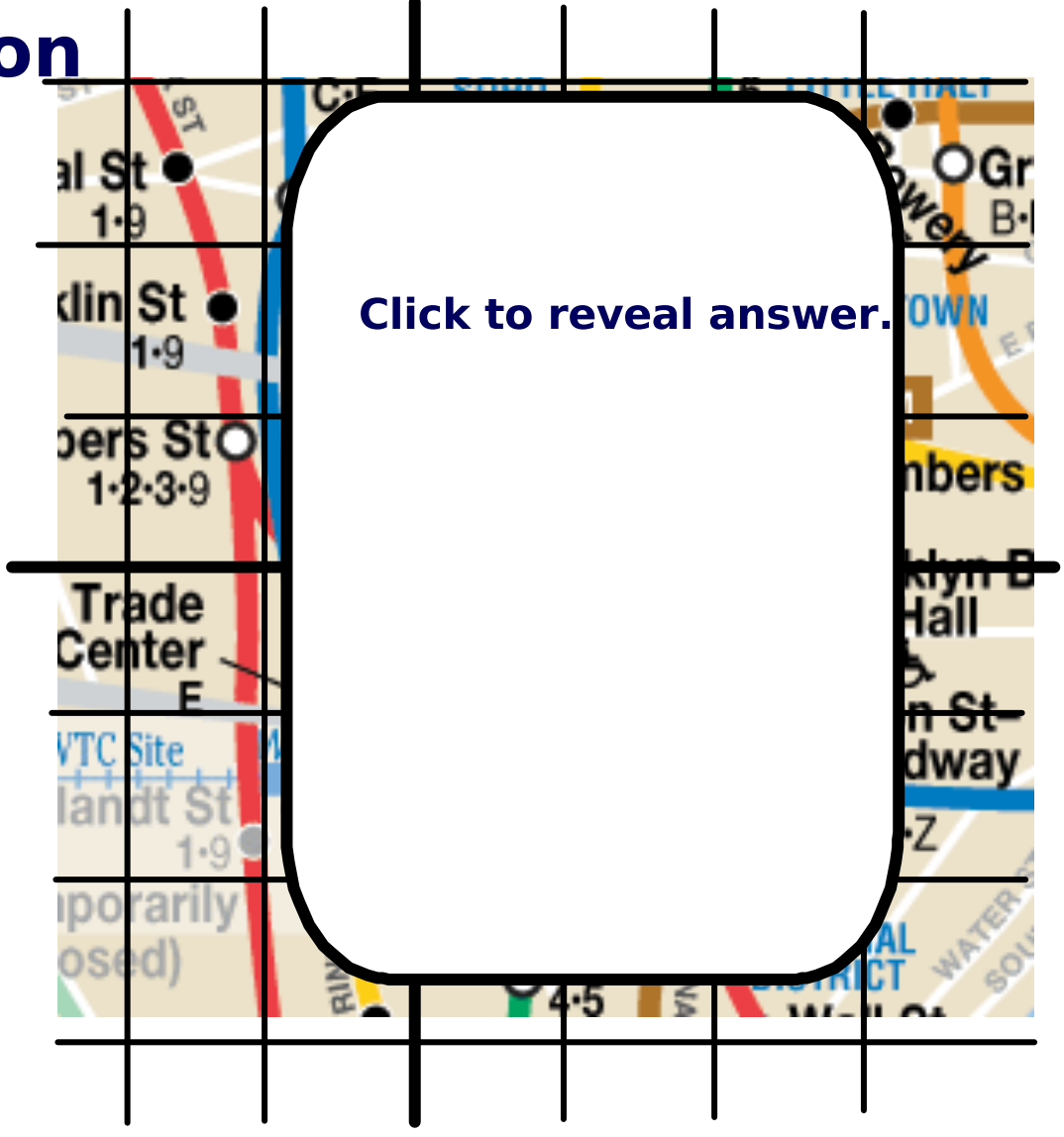
Fulton St.-Broadway

(2, -2)

World Trade Center

(-1/2, -1)

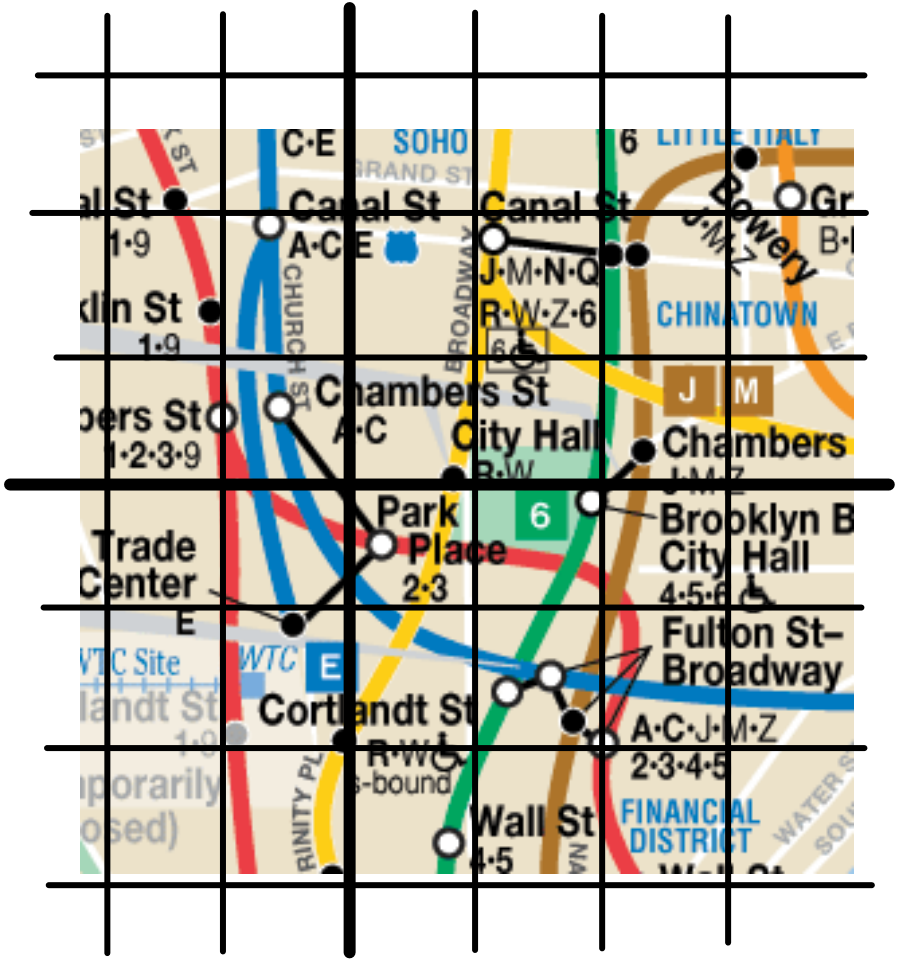
Navigation Solution



Navigation Application

If each unit equals .5 miles, calculate the distance between the Canal St. and the Fulton St. Broadway stop.

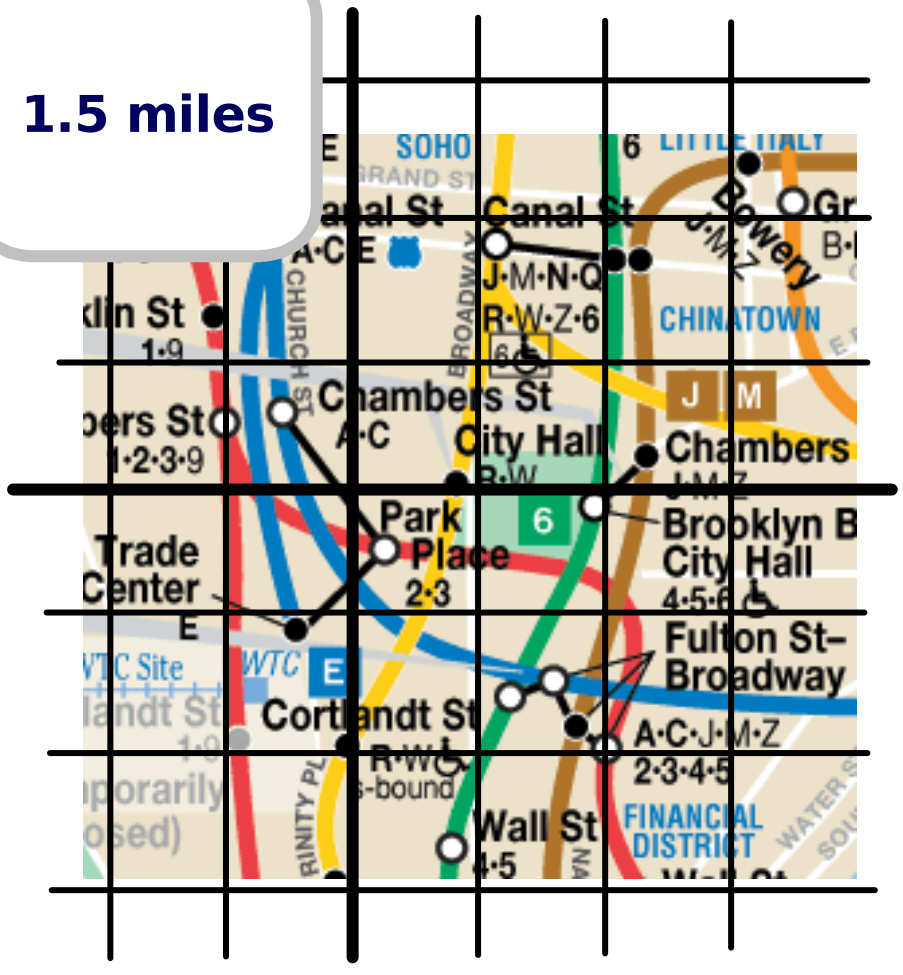
37 Each unit of the coordinate plane represents 1/4 mil
About how far is the intersection of Canal St and Ch
Street from the intersection of Canal St and Broadw



37 Each unit of the coordinate plane represents 1/4 mil
About how far is the intersection of Canal St and Ch
Street fro[illegible]section of Canal St and Broadw

Answer

1.5 miles



Distance

Study the table below. What pattern do you see between the set of points and the distance between them?

Is there a way to find the distance between the two points without graphing them first on a coordinate plane?

Distance

If two points have either the same x- or y-coordinate, the distance between them can be as follows:

If the different coordinates are either both positive or both negative, subtract their absolute values.
If the different coordinates are opposite signs, add their absolute values.

Let's look at the table again to see how this works:

38 Find the distance between (-8, 4) and (-8, 9).

Answer

38 Find the distance between (-8, 4) and (-8, 9).

Answer

5

39 Find the distance between (6, 9) and (-2, 9).

Answer

39 Find the distance between (6, 9) and (-2, 9).

Answer

8

40 Find the distance between (5, -7) and (5, -2).

Answer

40 Find the distance between (5, -7) and (5, -2).

Answer

5

—

Answer

41

—

Answer

5

Answer

6

43 Without plotting the points given, find the perimete
theshape given its coordinates.

S (5, -5) T (1, -5) U (1, 3) V (5, 3)

Answer

43 Without plotting the points given, find the perimete
theshape gi

5, 3)

Answer

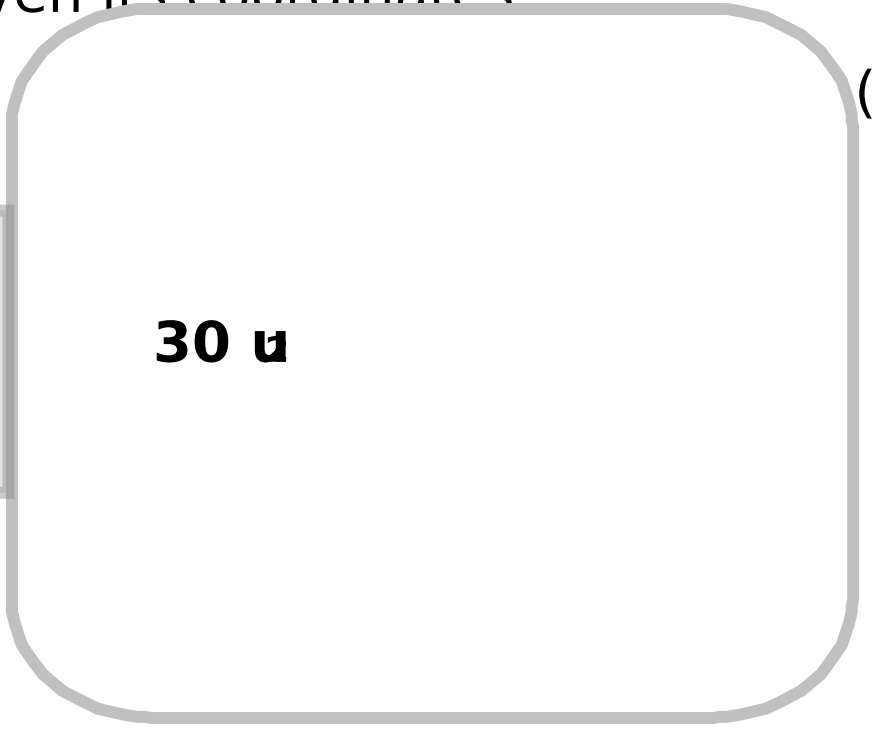
24 units

44 Without plotting the points given, find the area of th
shapegiven its coordinates.

L (-1, 1) M (-1, -5) N (4, -5) O (4, 1)

Answer

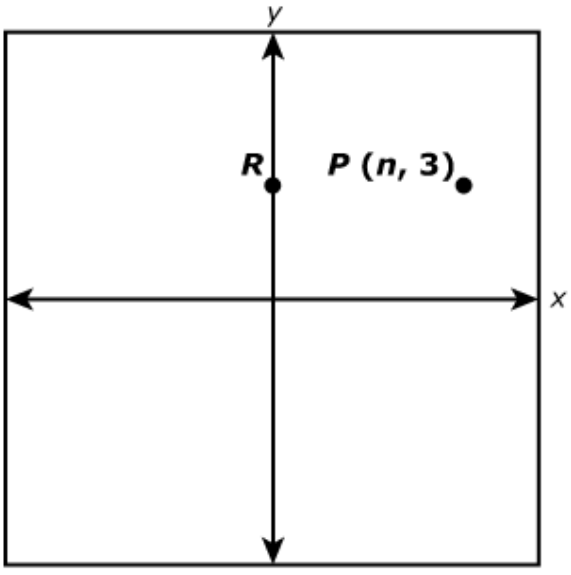
44 Without plotting the points given, find the area of th
shapegiven its coordinates



Answer

30 u

45 The graph shows the location of point P and point R
Point R is on the y-axis and has the same coordinat
point P.



Answer

Point Q is graphed at (n, -2). The distance from poir
point Q is equal to the distance from point P to poin

Part A What is the distance from point P to point Q?
Explain.

From PARCC PBA sample test calculator #6

45 The graph shows the location of point P and point R
Point R is on [illegible] same coordinat
point P.

Answer

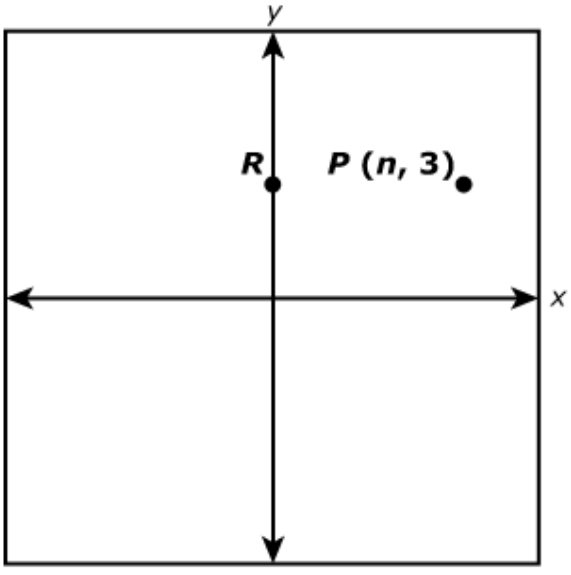
Distance from point P to point Q is 5 units because point P is 3 units above the x-axis. Point Q is 2 units below the x-axis. So 3 + 2 = 5

Point Q is g[illegible]ance from poin
point Q is equal to the distance from point P to poin

Part A What is the distance from point P to point Q? Explain.

From PARCC PBA sample test calculator #6

46 The graph shows the location of point P and point R
Point R is on the y-axis and has the same coordinat
point P.



Point Q is graphed at (n, -2). The distance from poir
point Q is equal to the distance from point P to poin

Part B What is the value of n? Explain.

Answer

From PARCC PBA sample test calculator #6

46 The graph shows the location of point P and point R
Point R is on the y-axis and has the same coordinat
point P.

Answer

Point Q is 5 units below point P, therefore the distance from point P to point R is also 5 units. Since R is on the y-axis, it has an x-coordinate of 0. So the x-coordinate of point P is 5 units to the right and is 5. The value for n is 5.

Point Q is nce from poin
point Q is equal to the distance from point P to poin

Part B What is the value of n? Explain.

From PARCC PBA sample test calculator #6

47 City planners are creating a neighborhood map on a coordinate gri

Neighborhood Planning

Building	Location
library	(−4, −6)
school	(5, −6)

Answer

The table shows the locations of the neighborhood l and school on a coordinate grid. In this coordinate g the distance between each gridline represents 1 mi What is the distance, in miles, between the library a the school?

(You can use the coordinate grid on the next page t you find the answer by plotting two points.)

From PARCC EOY sample test non-calculator #21

47 City planne rhood map on a coordinat

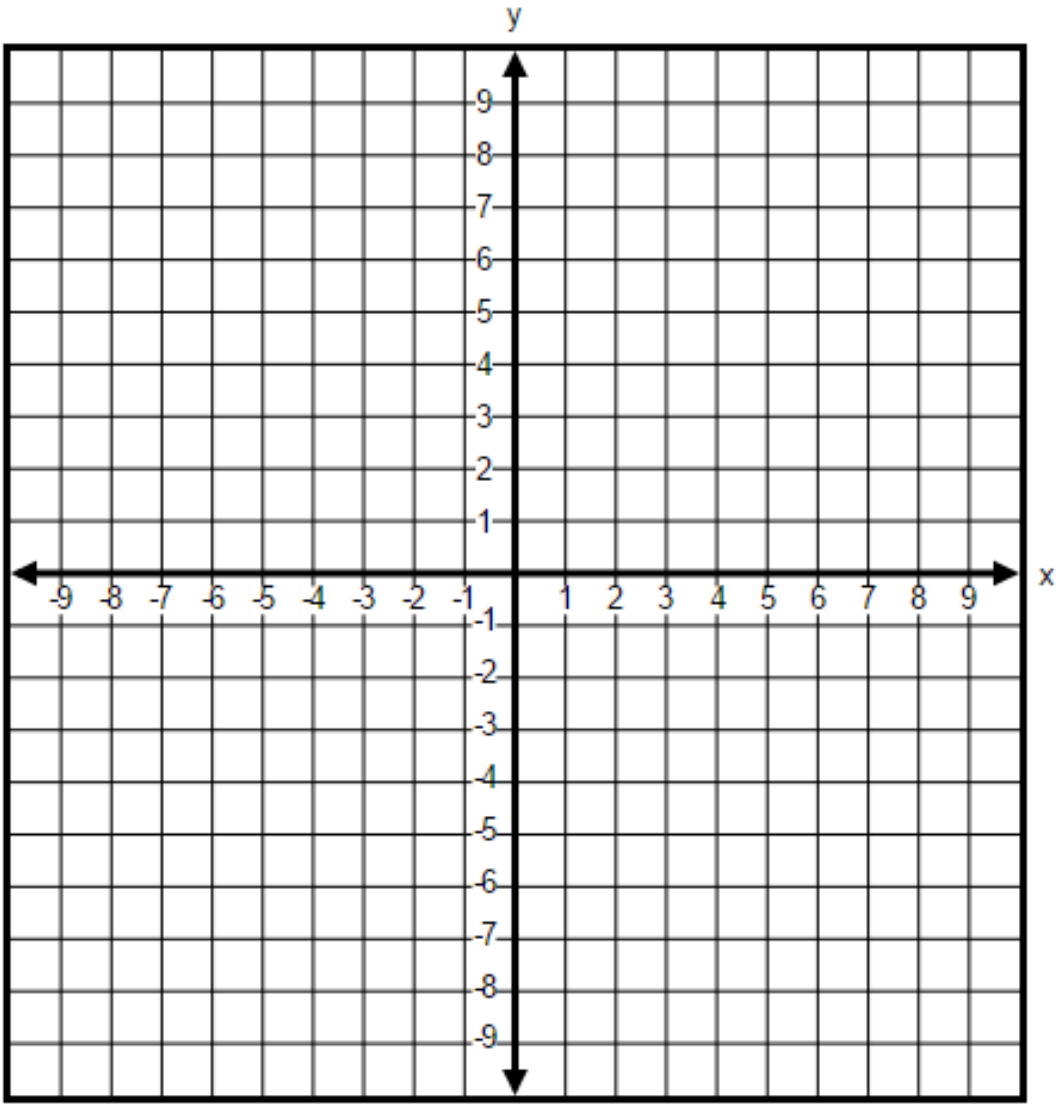
Answer

9 miles

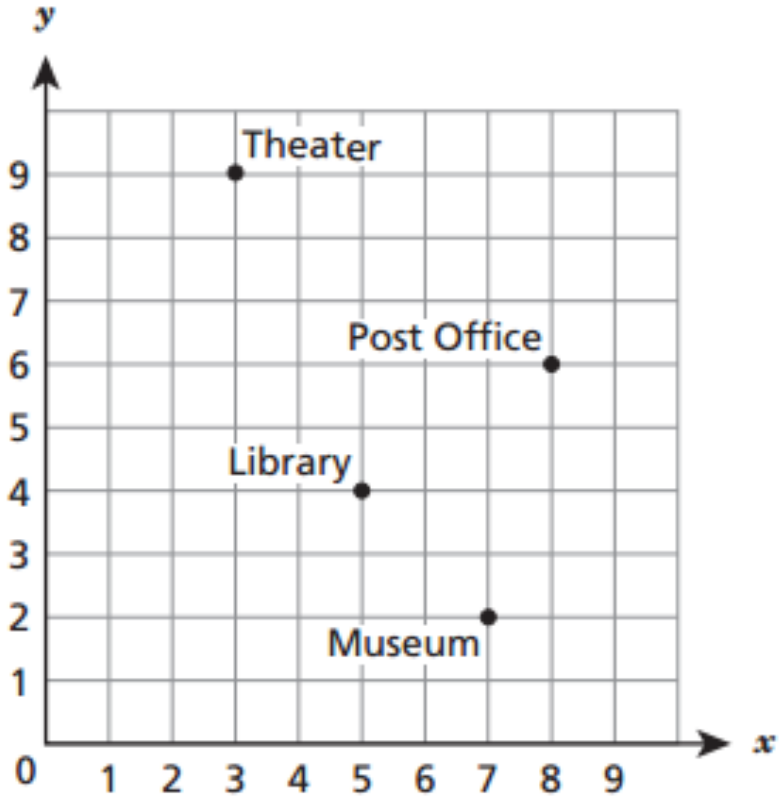
The table ighborhood l and scho coordinate g the distar resents 1 mi What is the een the library a the school?

(You can use the coordinate grid on the next page t you find the answer by plotting two points.)

From PARCC EOY sample test non-calculator #21


y
x
9
8
7
6
5
4
3
2
1
-9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9
-1
-2
-3
-4
-5
-6
-7
-8
-9

48 The points plotted on the coordinate grid below show differe
locations in a city. The grid lines represent the city's streets.
city plans to build a parking lot at the location represented b
coordinates (8,4). Which building is the shortest driving dista
from the parking lot?



- A Theater
- B Library
- C Museum
- D Post Office

Answer

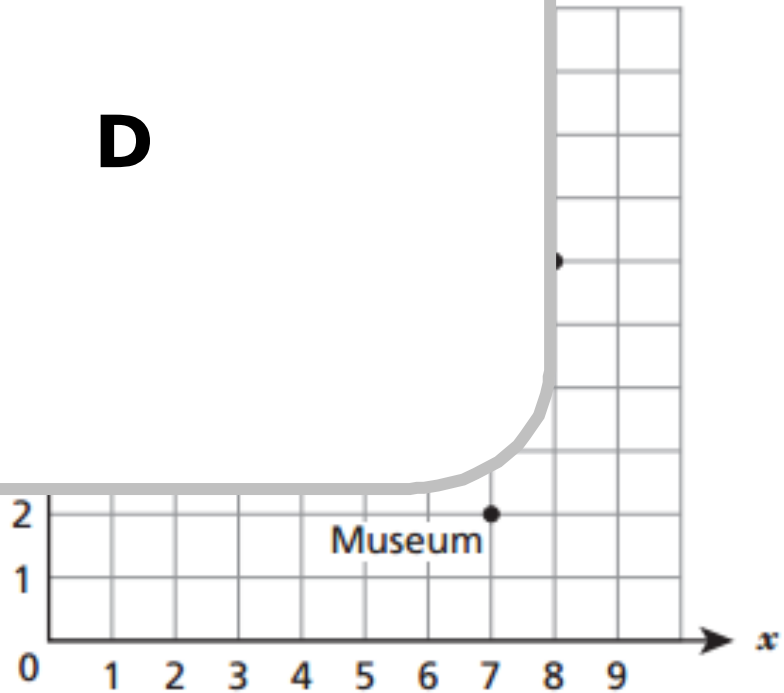
From NY Released Questions

48 The points plotted on the coordinate grid below show differe
locations in a city. The grid lines represent the city's streets.
city plans to b tion represented b
coordinate est driving dista
from the p

- A Thea
- B Librar
- C Museu
- D Post Offic

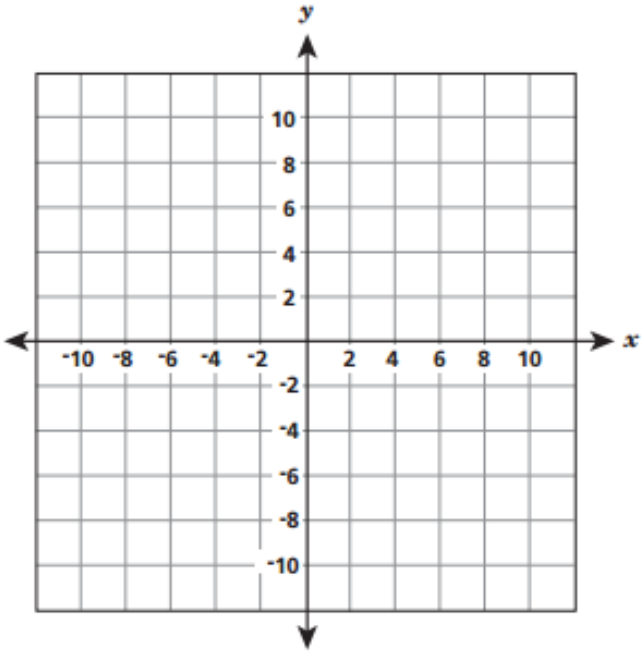
Answer

D



From NY Released Questions

49 The endpoints of a line segment can be represented on a coordinate grid by the points $A(-4,1)$ and $C(-4,-3)$. Graph and label each of the endpoints of the line segment on the coordinate below.



What is the distance, in units, between point A and point C?

Answer _____ units

Answer

From NY Released Questions

49 The endpoints of a line segment can be represented on a coordinate grid by the points $A(-4,1)$ and $C(-4,-3)$. Graph and label each of the endpoints of the line segment on the coordinate below.

What is the distance, in units, between point A and point C?

Answer _____ units

Answer

4 units

From NY Released Questions

Glossary & Standards

Teacher Notes

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Glossary & Standards

Vocabulary Words are bolded in the presentation. The text box the word is in is then linked to the page at the end of the presentation with the word defined on it.

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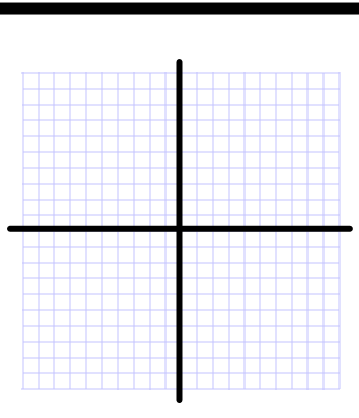
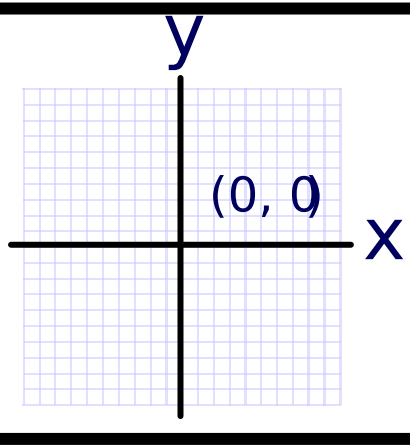
Cartesian Plane

The two dimensional plane or flat surface that is created when the x-axis intersects with the y-axis.



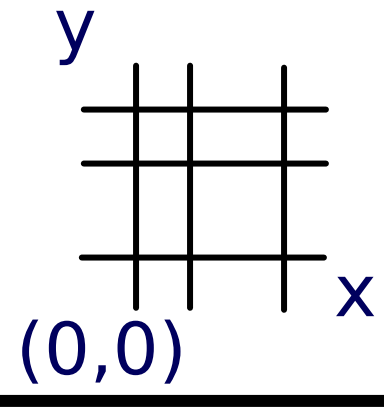
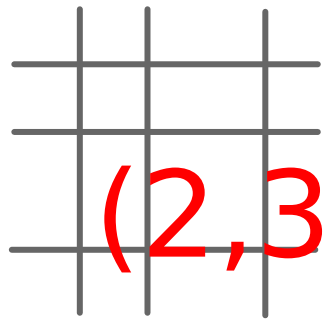


Also known as a coordinate graph and a coordinate plane.

Back to Instructio

Coordinates

A pair of values that show an exact position on a coordinate plane.

$(\bar{x},\bar{y})$		

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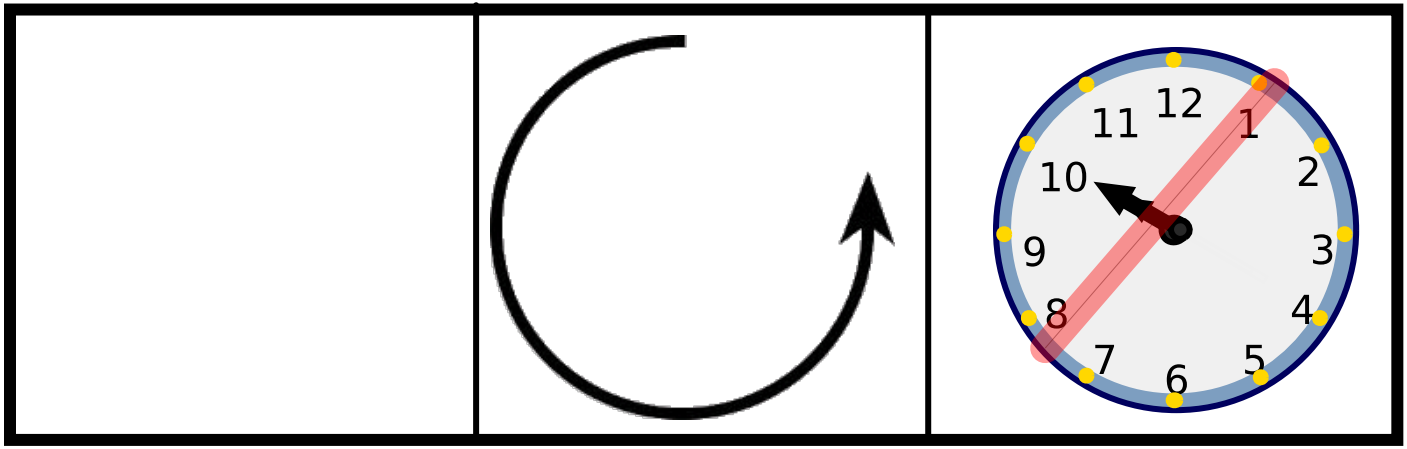
Counterclockwise

Turning in the opposite direction of the hands on a clock.



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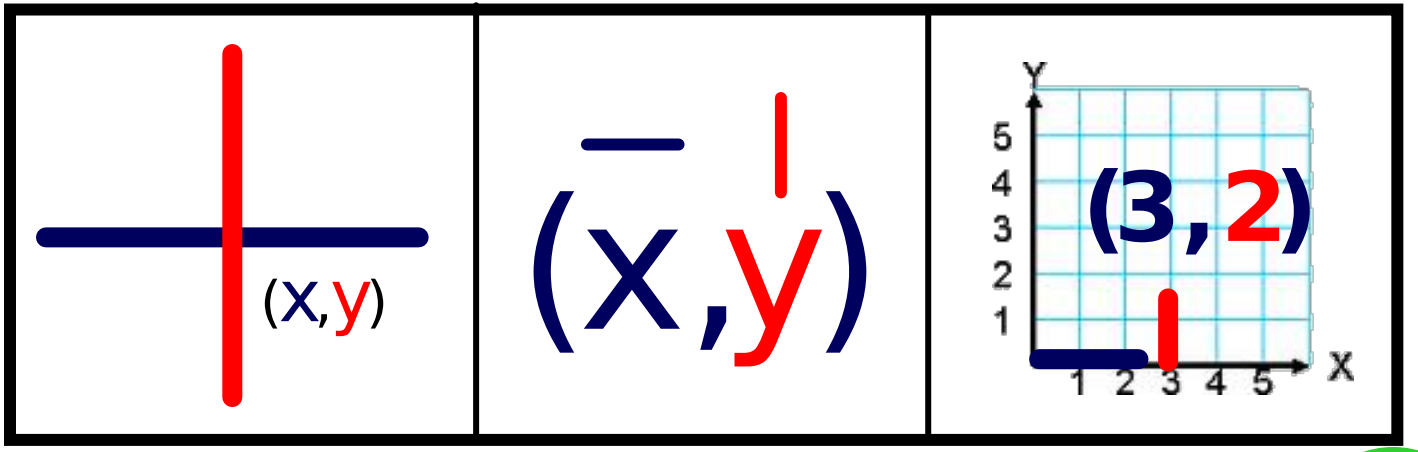
Ordered Pair

Coordinates on a coordinate graph can also be called an ordered pair.



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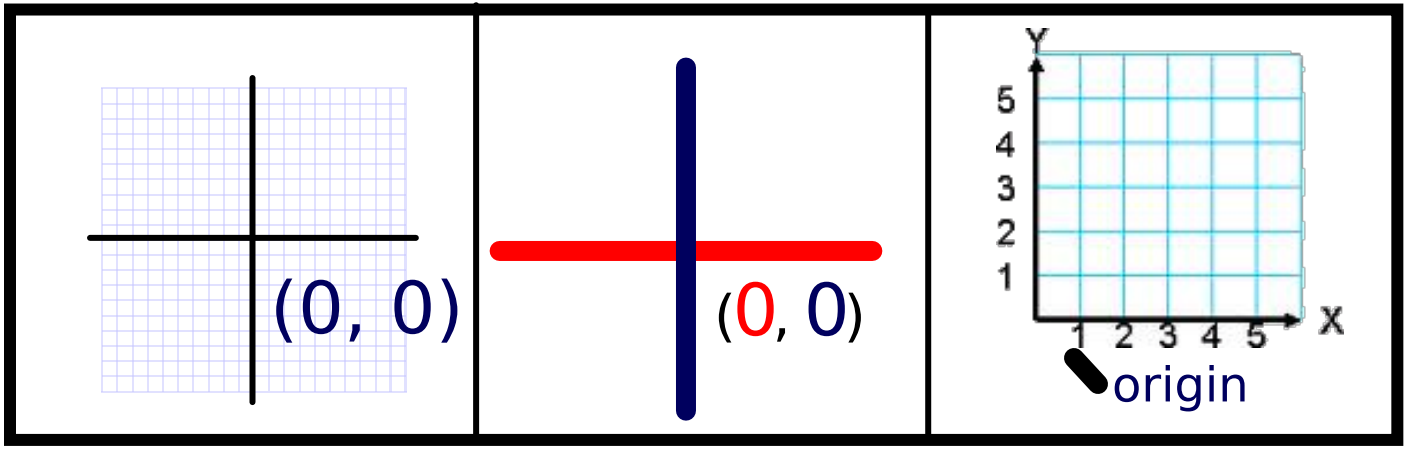
Origin

The point where zero on the x-axis intersects zero on the y-axis. The coordinates of the origin are (0, 0).



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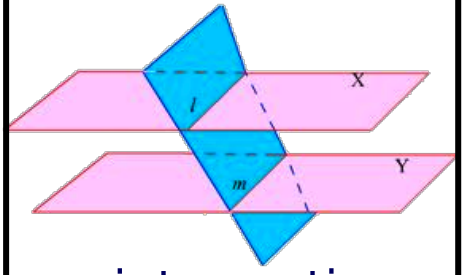
Plane

A flat, two-dimensional surface, that extends in every direction.

plane	// and  intersecting	We often draw planes with edges, but they have no edges.

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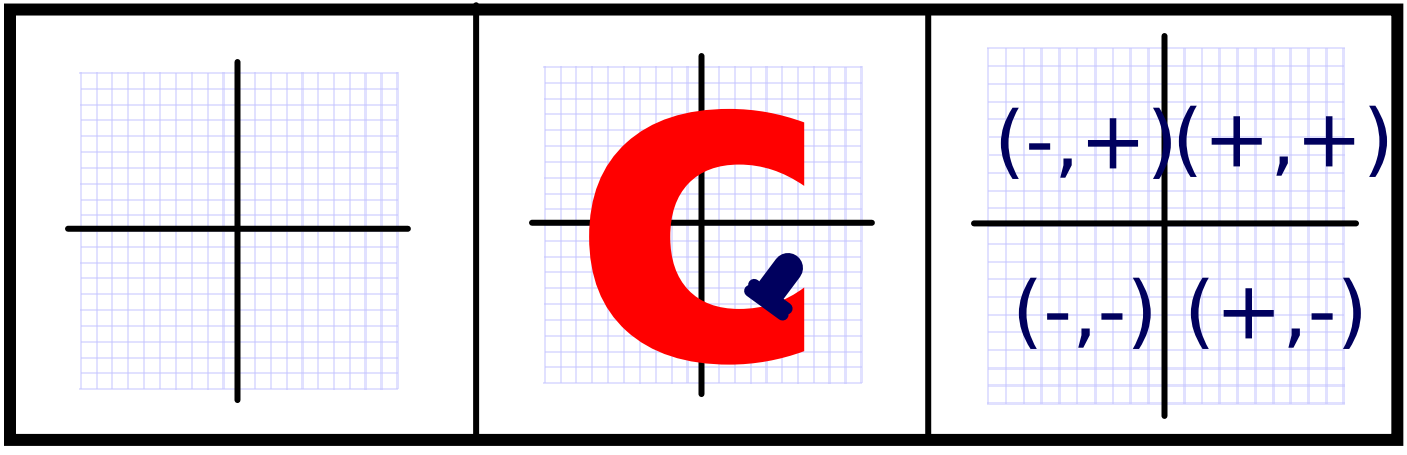
Quadrant

Any of the four regions created when the x-axis intersects the y-axis. They are usually numbered with Roman numerals



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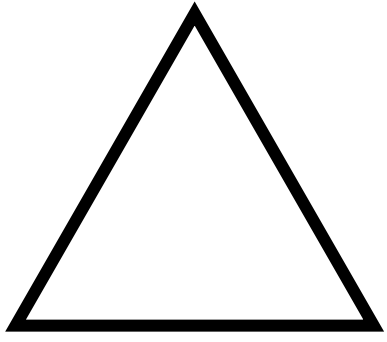
Vertex

A point where two or more straight lines meet.

	 **A** **Point A or vertex A**	The plural of vertex is "vertices"

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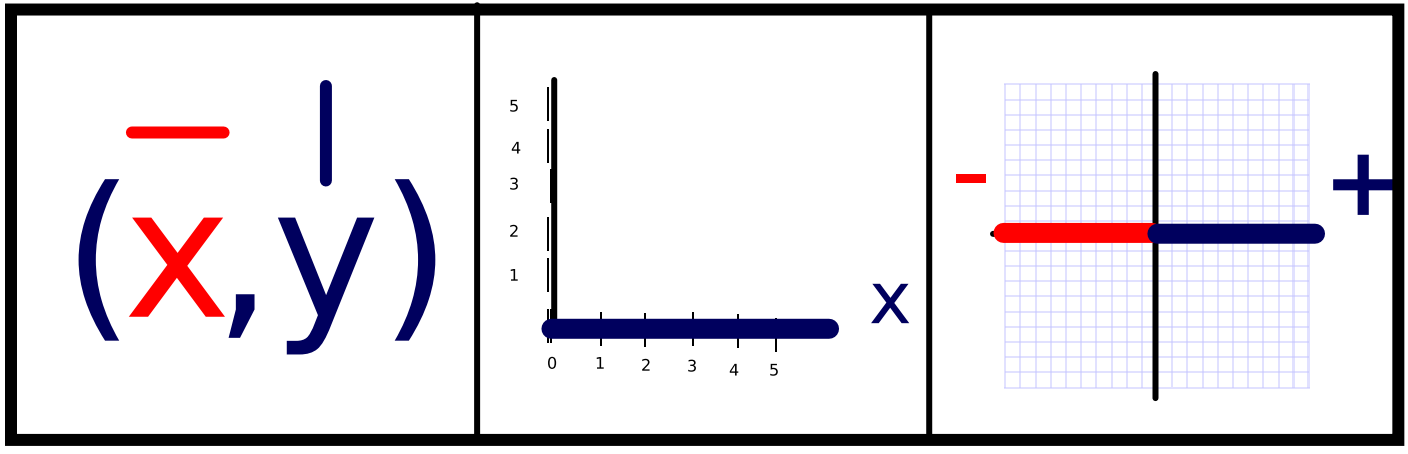
X-axis

Horizontal number line that extends indefinitely in both directions from zero. (Right- positive Left negative)



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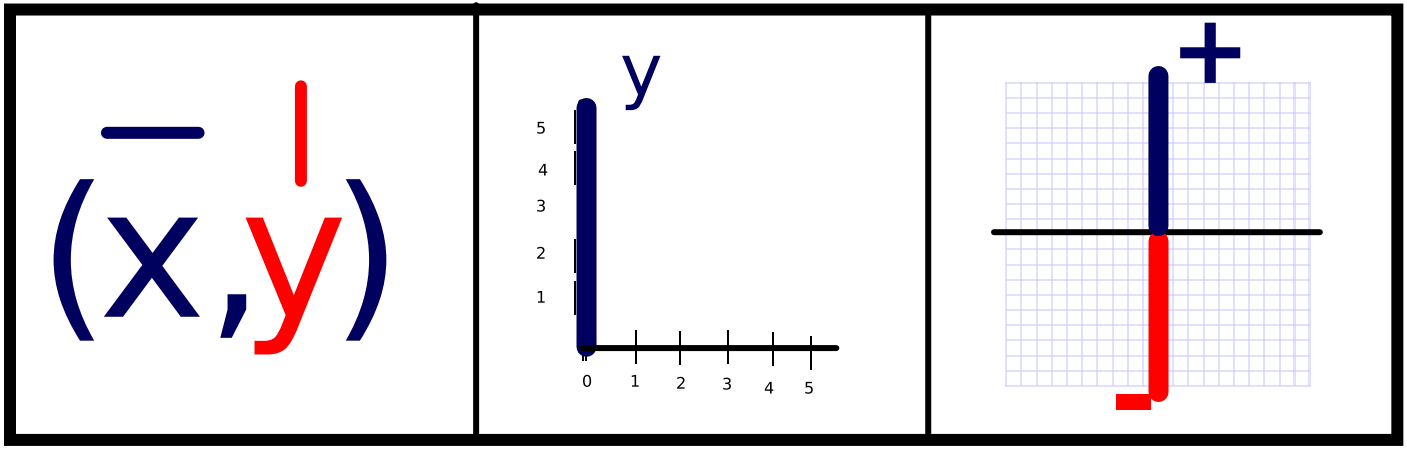
Y-axis

Vertical number line that extends indefinitely in both directions from zero. (Up- positive Down- negative)



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Standards for Mathematical Practices

MP1 Make sense of problems and persevere in solving them.

MP2 Reason abstractly and quantitatively.

MP3 Construct viable arguments and critique the reasoning of ot

MP4 Model with mathematics.

MP5 Use appropriate tools strategically.

MP6 Attend to precision.

MP7 Look for and make use of structure.

MP8 Look for and express regularity in repeated reasoning.

Click on each standard to bring you to an example of how to meet this standard within the unit.

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