

5.0 Introduction to Linear Equations

November 16, 2018 11:18 AM

The **coordinate plane** is made of two intersecting **LINES** one horizontal & one vertical.

coordinate plane
"cartesian plane"

Y-axis Vertical

X-axis Horizontal

vocabulary

QUAD = quadrant

Points on y-axis are always $(0, y^{\#})$

"The $(0,0)$ Origin"

Points are always $(x^{\#}, 0)$

Quad II (QII) Quad I (QI)

Quad III (QIII) Quad IV (QIV)

Name: _____

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Detailed description: The diagram illustrates the components of a coordinate plane. At the top, two signs read 'coordinate' and 'plane', with a note that the 'coordinate plane' is also known as the 'cartesian plane'. Below these, a coordinate plane is shown on a grid. The horizontal axis is labeled 'X-axis' and 'Horizontal', and the vertical axis is labeled 'Y-axis' and 'Vertical'. The origin is marked with a red dot and labeled 'The (0,0) Origin'. The four quadrants are labeled: 'Quad II (QII)' in the top-left, 'Quad I (QI)' in the top-right, 'Quad III (QIII)' in the bottom-left, and 'Quad IV (QIV)' in the bottom-right. A dashed box labeled 'vocabulary' encloses the origin and the first quadrant. A note states 'QUAD = quadrant'. Another note says 'Points on y-axis are always (0, y#)' with a red underline under the 0. A third note says 'Points are always (x#, 0)' with a red underline under the 0. A small box at the top right says 'The coordinate plane is made of two intersecting LINES one horizontal & one vertical.' A 'Name:' field is at the bottom left. A copyright notice '© Copyright 2018 Math Giraffe' and the number '3' are at the bottom right.

Name: _____

Plotting Points

1 Start at the **origin**

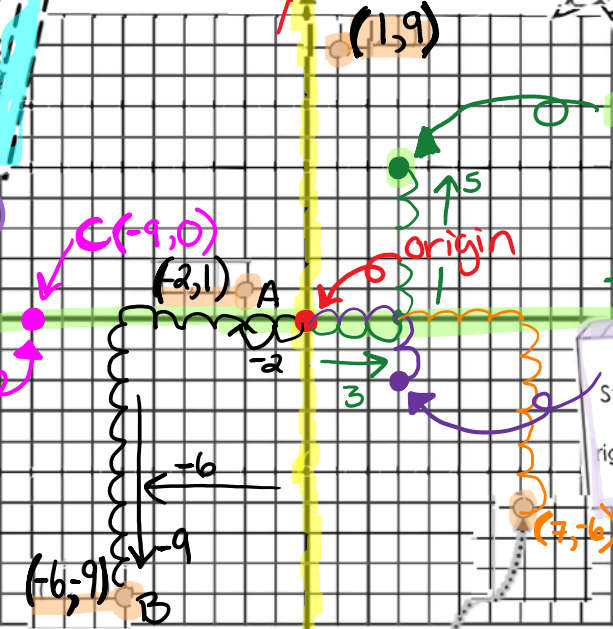
2 Count out the **(x-value)** **X-coordinate**

3 From there, count out the **(y-value)** **Y-coordinate**

**DO NOT go back to origin!!*

Fill in the blanks to write ordered pairs for the points that are labeled.

An "ordered pair" identifies a point and contains an x-coordinate and y-coordinate.



Ordered Pairs for Quadrant II: $(-, +)$

Ordered Pairs for Quadrant I: $(+, +)$

Points on axes do not lie in any Quadrant

Try plotting $(3, -2)$. Start at the origin. Count 3 units to the right, then 2 units down. Now try $(-1, 5)$.

Ordered Pairs for Quadrant III: $(-, -)$

Ordered Pairs for Quadrant IV: $(+, -)$

The plural of "axis" is axes

X-coordinate

Y-coordinate

→ Right and UP are **POSITIVE** movements.

Remember

← Left & DOWN are **NEGATIVE** movements.

ordered pair

Which quadrants will have positive x-coordinates? y-coordinates? Place a + or - in each circle to show what the ordered pairs will look like in each quadrant. (Like this): $(+, -)$

5.0 Intro to Graphing in Four Quadrants

A **Cartesian coordinate system** is made up of two real lines:

One **horizontal**, called the x-axis

One **vertical**, called the y-axis

The point where the axes cross is called the origin

The axes divide the page into four sections called Quadrants (1-4)

Each point has two coordinates presented in the form: (x, y) :

"ordered pair"

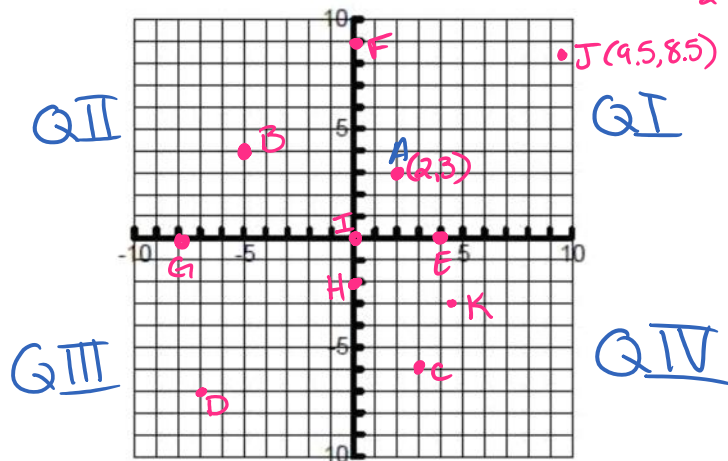
The first one, called the x-coordinate gives the position of the point relative to the origin (0,0) ... center

The second one, called the y-coordinate gives the position of the point relative to the x-axis (x-coordinate).

Example #1:

a) Plot and label the following points on the grid provided.

A(2, 3) B(-5, 4) C(3, -6) D(-7, -7) E(4, 0) F(0, 9)
 G(-8, 0) H(0, -2) I(0, 0) *J(9.5, 8.5) *K($\frac{9}{2}, -3$) $\frac{9}{2} = 4.5$



b) Where applicable, state which quadrant the coordinate is in.

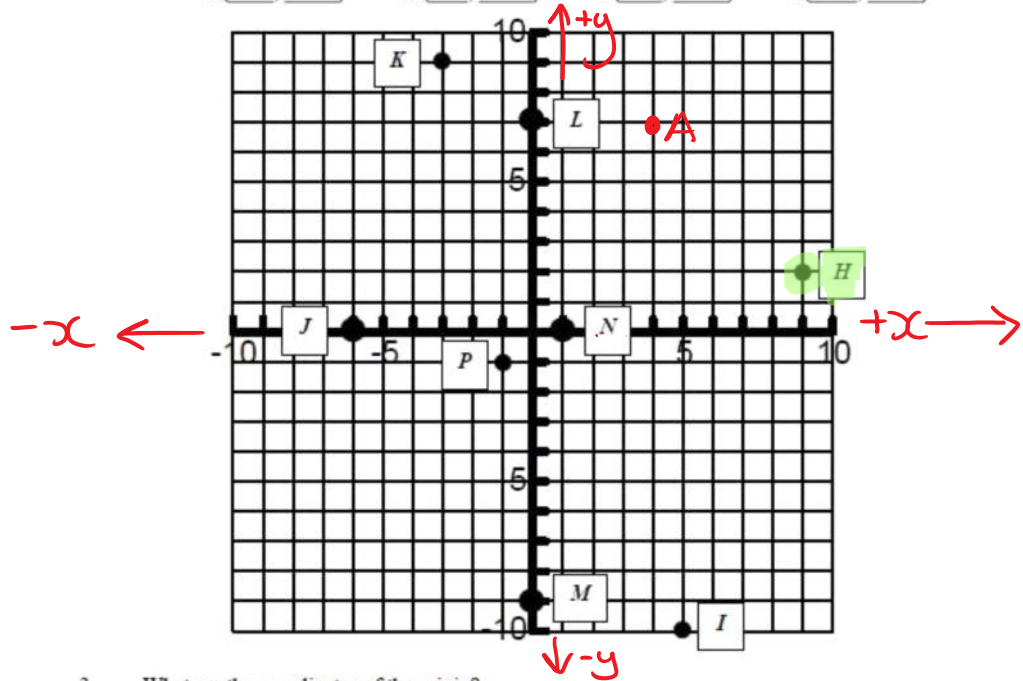
A: Q1 B: Q2 C: Q4 D: Q3 E: - F: -
 G: - H: - I: - J: Q1 K: Q4

Practice:

1. **Plot the following points:** A(4, 7) B(-3, 5) C(-5, -8) D(6, -1)
 E(7, 0) F(-9, 0) G(0, 3)

2. **Give the coordinates of the points shown on the graph.**

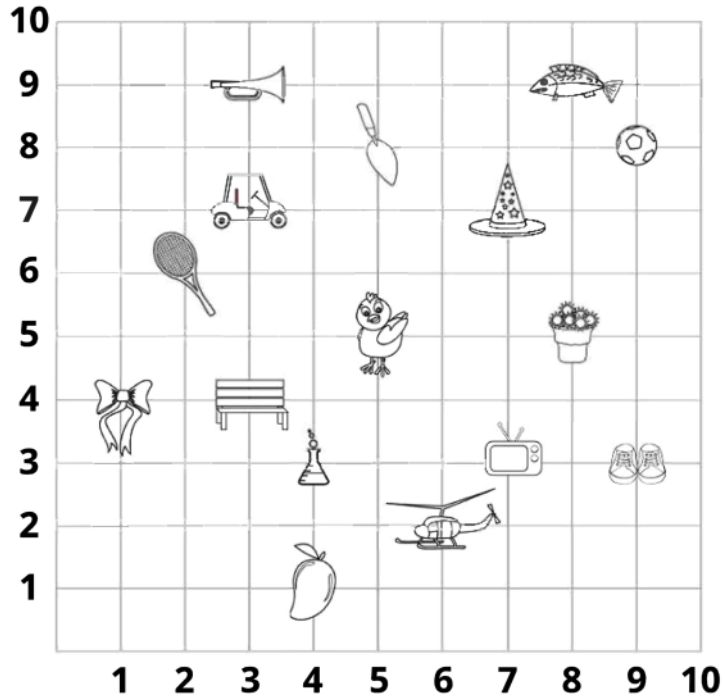
(x, y) H(9, 2) I(____, ____)
 J(____, ____) K(____, ____)
 L(____, ____) M(____, ____) N(____, ____) P(____, ____)



3. What are the coordinates of the origin? _____
4. Where are points that have an x-coordinate of 0 located? _____
 Where are points that have a y-coordinate of 0 located? _____
5. Fill in the chart:

Quadrant	I	II	III	IV
Sign of x-coordinate				
Sign of y-coordinate				

Ordered Pairs (x,y)



Write the ordered pair for each of the objects listed.

example: television - (7,3)

- a. helicopter - _____
- b. shoes - _____
- c. pepper - _____
- d. wizard's hat - _____
- e. fish - _____
- f. golf cart - _____

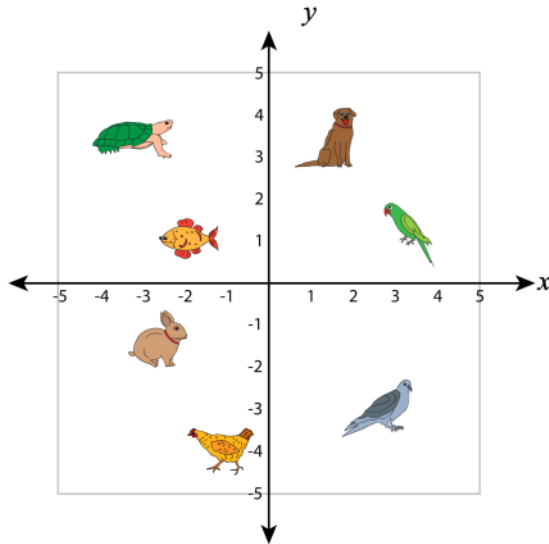
Tell which object is located at each point.






- g. (3,4) - _____
- h. (2,6) - _____
- i. (1,4) - _____
- j. (5,5) - _____
- k. (9,8) - _____
- l. (3,9) - _____



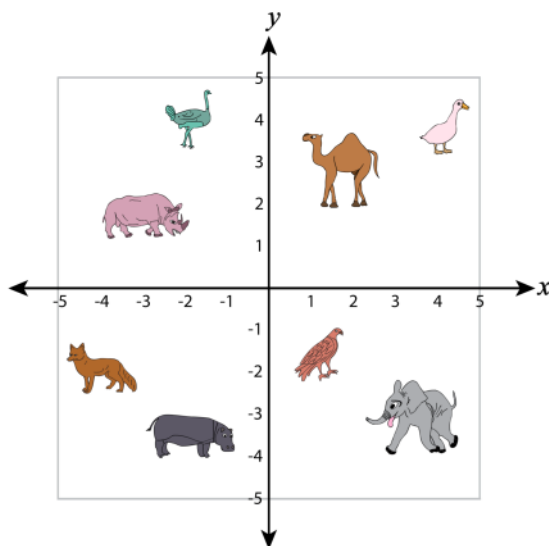
Identifying Quadrant

A) Write the quadrant belongs to each animal.



-  _____
-  _____
-  _____
-  _____
-  _____

B) Write the animals belong to each quadrant.



I - quadrant : _____ , _____

II - quadrant : _____ , _____

III - quadrant : _____ , _____

IV - quadrant : _____ , _____

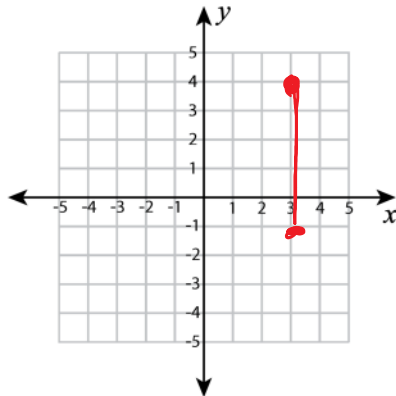


connect dot

Plotting Points - Line segments

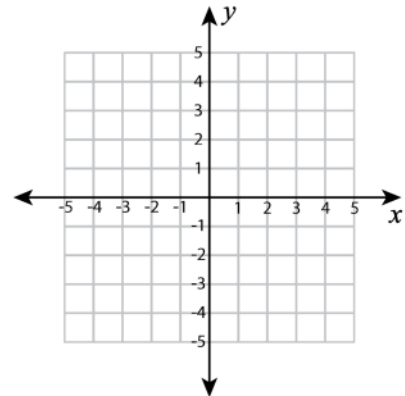
Plot each set of ordered pairs. Join the points and find the length of the line segment.

1) $(3, -1), (3, 4)$



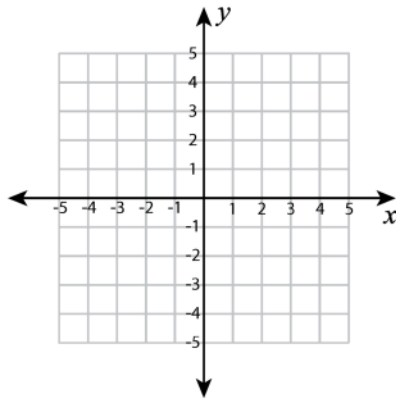
Length of the line segment = _____

2) $(-4, 1), (4, 1)$



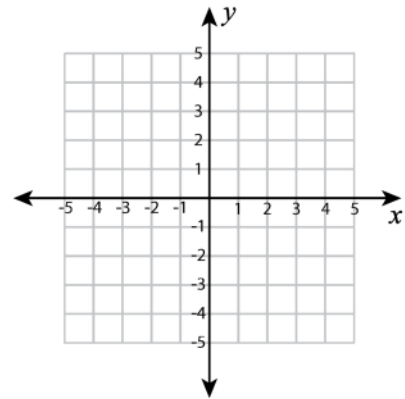
Length of the line segment = _____

3) $(-3, 1), (-3, 4)$

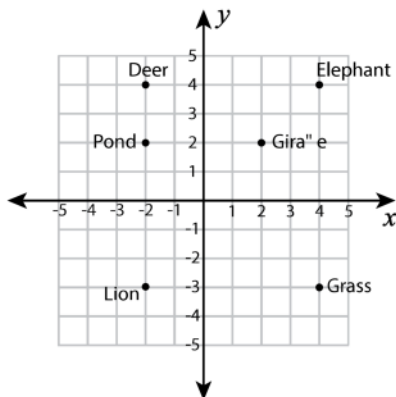


Length of the line segment = _____

4) $(-1, -4), (1, -4)$



Length of the line segment = _____



5) How far an elephant is away from the grass? _____

6) Which is closer to the pond, giraffe or deer? _____

7) How many units does the lion move to catch the deer? _____



Coordinate Graphing Mystery Picture - Four Quadrants

Plot the ordered pairs and connect them with a straight line as you plot.

*

START
 (7,2)
 (9,2)
 (9,4)
 (7,4)
 (7,2)
 STOP

line

START
 (-1,0)
 (1,0)
 (0,4)
 (-1,0)
 STOP

line

START
 (-13,8)
 (-10,12)
 (-5,11)
 (-9,14)
 (-7,18)
 (-10,16)
 (-13,20)
 (-12,15)
 (-16,14)
 (-12,13)
 (-13,8)
 STOP

START
 (8,-9)
 (9,-6)
 (12,-9)
 (11,-5)
 (14,-6)
 (12,-2)
 (16,-1)
 (12,2)
 (16,4)
 (12,5)
 (13,9)
 (10,7)

(9,10)
 (7,7)
 (6,8)
 STOP

START
 (-3,-9)
 (-2,-6)
 (0,-10)
 (1,-6)
 (3,-10)
 (4,-8)
 STOP

START
 (5,19)
 (1,13)
 (3,9)
 (0,8)
 (1,6)
 (-2,6)
 (-4,-5)
 (-1,-5)
 (-1,-2)
 (1,-2)
 (1,-5)
 (4,-5)
 (2,7)
 (6,8)

(3,13)
 (5,19)
 STOP
 START
 (-5,-8)
 (-7,-6)
 (-9,-9)
 (-10,-6)
 (-13,-10)
 (-12,-6)
 (-16,-7)
 (-13,-4)

(-16,-2)
 (-12,-1)
 (-16,2)
 (-12,3)
 (-15,6)
 (-11,7)
 (-10,10)
 (-8,7)
 (-5,10)
 (-3,6)
 (-1,10)
 (0,8)
 STOP

START
 (-3,-19)
 (0,-17)
 (3,-19)
 (1,-16)
 (3,-14)
 (1,-14)
 (0,-11)
 (-1,-14)
 (-3,-14)
 (-1,-16)
 (-3,-19)
 STOP

START
 (7,-4)
 (7,0)
 (10,0)
 (11,1)
 (11,5)
 (10,6)
 (5,6)
 (5,-5)
 (7,-5)
 (4,-8)
 (7,-10)
 (4,-12)
 (9,-19)

(7,-12)
 (10,-10)
 (6,-8)
 (10,-3)
 (7,-4)
 STOP

START
 (9,17)
 (12,16)
 (15,19)
 (14,15)
 (17,14)
 (14,13)

(15,8)
 (12,12)
 (7,11)
 (11,14)
 (9,17)
 STOP

START
 (-10,-19)
 (-4,-14)
 (-7,-10)
 (-3,-9)
 (-6,-3)
 (-9,-3)
 (-4,6)
 (-12,6)
 (-11,4)
 (-8,4)
 (-13,-5)
 (-6,-5)
 (-5,-8)
 (-9,-10)
 (-6,-14)
 (-10,-19)
 STOP

Coordinate Graphing Mystery Picture - Four Quadrants

Name: _____

