

What is Coordinate Geometry?

<u>Word Box</u>	
coordinate-plane	coordinates
<u>ordered pair</u>	abscissa
quadrants	ordinate
x-axis	origin
y-axis	

Complete the following sentences:

1) A plane is formed by the intersection of a horizontal number line with a vertical number line. A Coordinate plane is a two-dimensional surface on which points are plotted and located by their x and y coordinates.

2) The **horizontal line** is called the x-axis.

3) The **vertical line** is called the y-axis.

4) The point where the axes cross is called the origin, and this point is represented by the ordered pair (0,0).

5) Other points are represented by ordered pairs according to their distance with respect to each axis. The ordered pair (-2,3) corresponds to -2 on the x-axis and 3 on the y-axis. Each ordered pair is a set of coordinates for the point it names.

6) The x-coordinate is called the abscissa.
 The y-coordinate is called the ordinate.
 A point is the graph of its ordered pair.

7) The x-axis and the y-axis divide the graph into four regions called Quadrants.

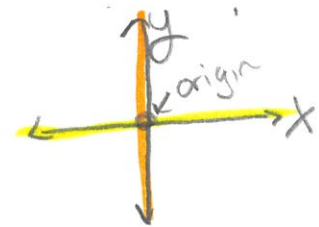
The signs of the coordinates in each quadrant are:

Quadrant I: (+, +)

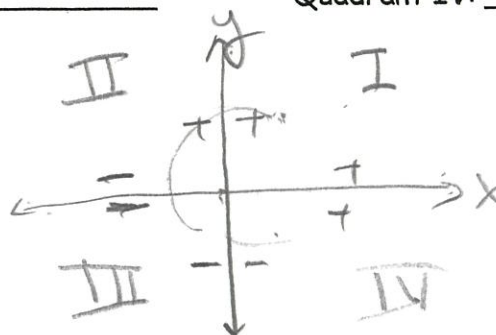
Quadrant II: (-, +)

Quadrant III: (-, -)

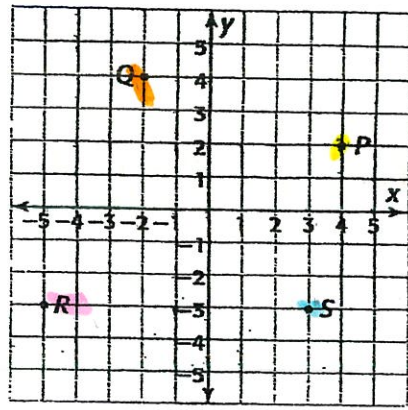
Quadrant IV: (+, -)



(x,y)



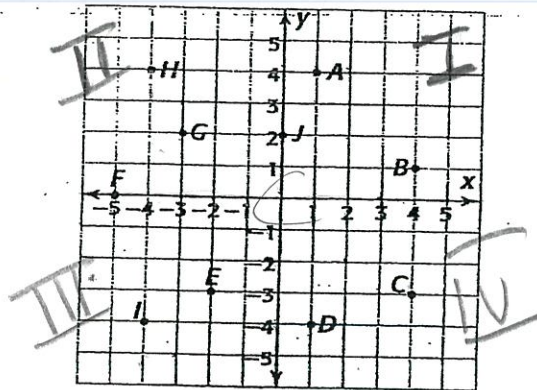
Use an ordered pair to name the location of each point.



(x, y)

- a. P $(4, 2)$ | b. Q $(-2, 4)$ | c. R $(-5, -3)$ | d. S $(3, -3)$

9) Name the point that has the given coordinates. Give the quadrant for each point.

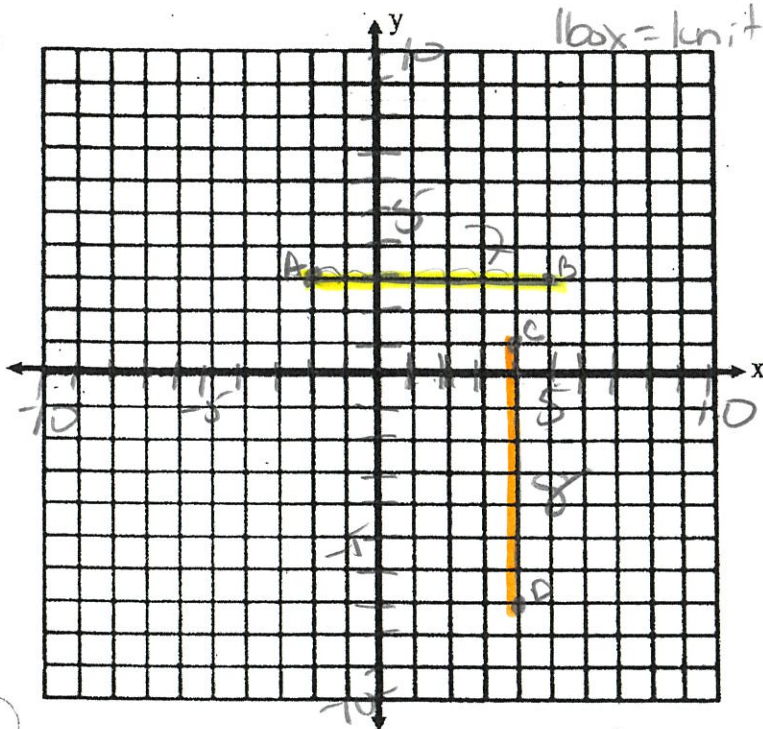


(x, y)

Coordinates	Point	Quadrant / axis
a. $(-5, 0)$	F	x-axis
b. $(4, -3)$	C	IV
c. $(-4, 4)$	H	II
d. $(0, 2)$	J	y-axis
e. $(-2, -3)$	E	III
f. $(4, 1)$	B	I

How Can We Find The Distance Between Two Points On The Coordinate Plane?

1)



(a) Plot the points below and connect them to form segment AB.

$$A(-2, 3) \quad B(5, 3)$$

(b) What is the length of segment AB?

$$AB = \underline{7}$$

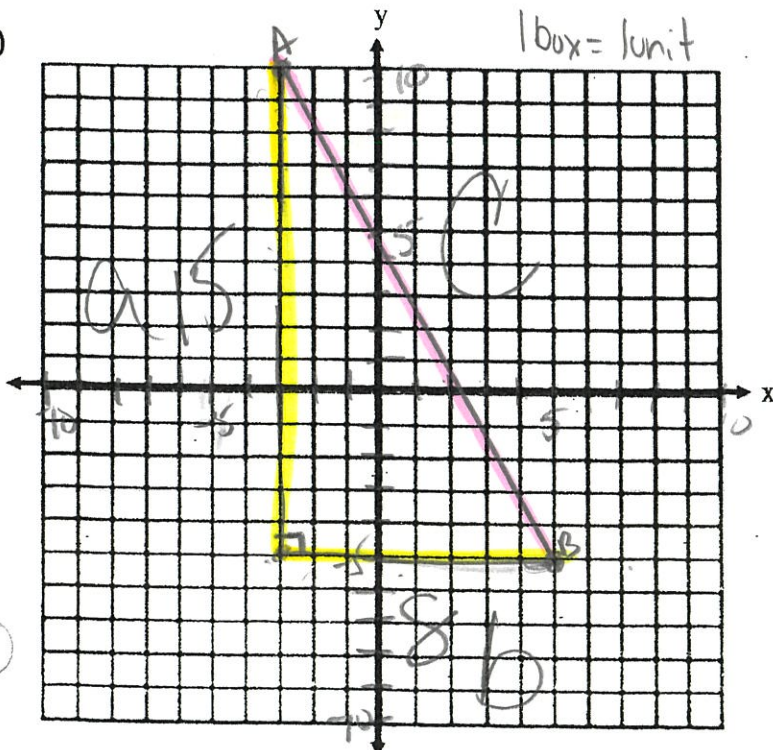
(c) Plot the points below and connect them to form segment CD.

$$C(4, 1) \quad D(4, -7)$$

(d) What is the length of segment CD?

$$CD = \underline{8}$$

2)



(a) Plot the points below and connect them to form segment AB.

$$A(-3, 10) \quad B(5, -5)$$

(b) What is the length of segment AB?

$$AB = \underline{17}$$

$$a^2 + b^2 = c^2$$

$$15^2 + 8^2 = c^2$$

$$225 + 64 = c^2$$

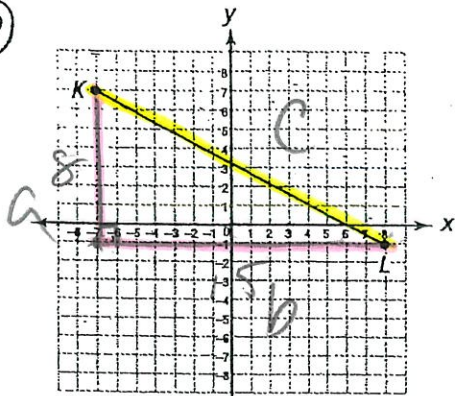
$$\sqrt{289} = \sqrt{c^2}$$

$$c = 17$$

$$\overline{AB} = 17$$

#3 + #4: Determine the length of each line segment. Show your work.

3



$$a^2 + b^2 = c^2$$

$$8^2 + 15^2 = c^2$$

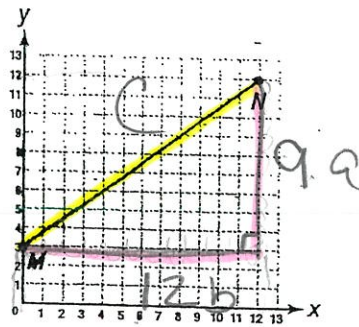
$$64 + 225 = c^2$$

$$\sqrt{289} = \sqrt{c^2}$$

$$c = 17$$

$\overline{KL} = 17$

4



$$a^2 + b^2 = c^2$$

$$9^2 + 12^2 = c^2$$

$$81 + 144 = c^2$$

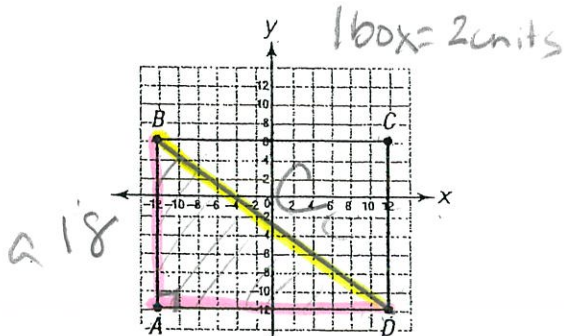
$$\sqrt{225} = \sqrt{c^2}$$

$$c = 15$$

$\overline{MN} = 15$

5

DRAW Draw a diagonal for rectangle ABCD and calculate its length. Is it possible to draw a different diagonal for this rectangle that has a different length? Explain.



1 box = 2 units

$$a^2 + b^2 = c^2$$

$$18^2 + 24^2 = c^2$$

$$324 + 576 = c^2$$

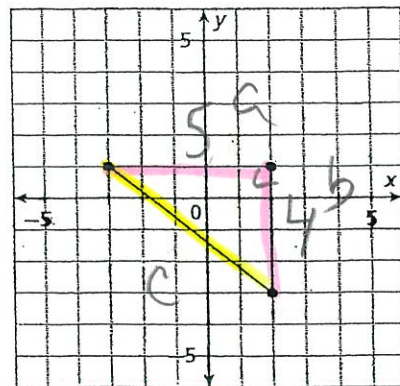
$$\sqrt{900} = \sqrt{c^2}$$

$$c = 30$$

$\overline{BD} = 30$

6

Approximate the length of the hypotenuse to the nearest tenth without using a calculator.



$$a^2 + b^2 = c^2$$

$$5^2 + 4^2 = c^2$$

$$25 + 16 = c^2$$

$$\sqrt{41} = \sqrt{c^2}$$

$$c = 6.40$$