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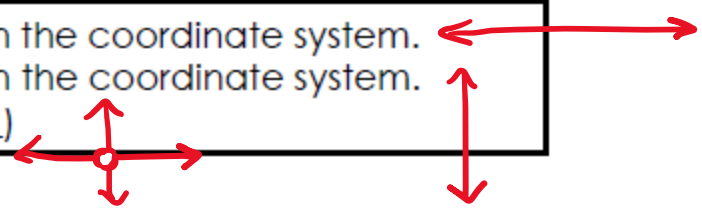
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DISTANCE IN THE COORDINATE PLANE

GEOMETRY

VOCABULARY

- **x-axis:** Horizontal number line in the coordinate system.
- **y-axis:** Vertical number line in the coordinate system.
- **Origin:** Point that is located at (0, 0)

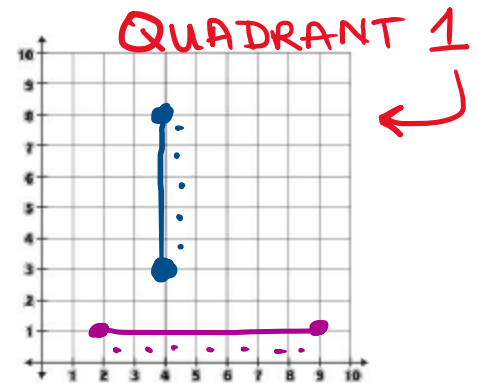


GUIDED NOTES:

1. Points are located in reference to the x-axis and the y-axis.
 $x \rightarrow$ Right or Left
 $y \rightarrow$ Up or down
2. Ordered pairs are always named (x, y)
3. It is possible to find the length of a horizontal or vertical line drawn in a coordinate plane.
4. One way you can find the length is by plotting points, drawing the line and counting to find the length.
5. You can find the length of any vertical or horizontal line in the coordinate plane by using the coordinates of the endpoints.
6. The endpoints of horizontal lines have the same y-values and different x-coordinates.
7. To find the distance between the endpoints of a horizontal line, subtract the x-values (if in the SAME QUADRANT)
8. The endpoints of vertical lines have the same x-values and different y-coordinates.
9. To find the distance between the endpoints of a vertical line, subtract the y-values (if in the SAME QUADRANT)
10. You can find Area and Perimeter of polygons by finding the length of sides of a polygon in a coordinate plane.

GUIDED PRACTICE:

Endpoints	Work	Length
$(4, \underline{3})$ $(4, \underline{8})$ ↓ ↓	Vertical - subtract y-values $8 - 3 = 5$	5 units
$(\underline{2}, 1)$ $(\underline{9}, 1)$ ↑ ↑	horizontal - subtract x-values $9 - 2 = 7$	7 units



DISTANCE IN THE COORDINATE PLANE

PRACTICE PROBLEMS:

1 Find the length of a line with the following endpoints: A (0,4) B (0,9)

$$9 - 4 = \boxed{5}$$

BOTH POSITIVE

SAME QUADRANT - SUBTRACT

2 Find the length of a line with the following endpoints: C (4,10) D (10,10)

$$10 - 4 = \boxed{6}$$

3 Find the length of a line with the following endpoints: E (3,5) F (2,5)

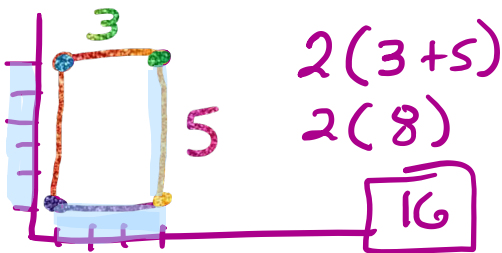
$$3 - 2 = \boxed{1}$$

4 Find the length of a line with the following endpoints: G (2,9) H (2,1)

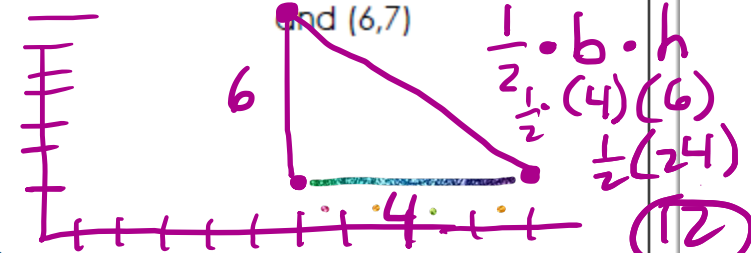
$$9 - 1 = \boxed{8}$$

SAME SIGNS, SAME QUADRANT - SUBTRACT -

5 Find the perimeter of a rectangle with the following vertices: A (1,1) B (1,6) C (4,6) D(4,1)



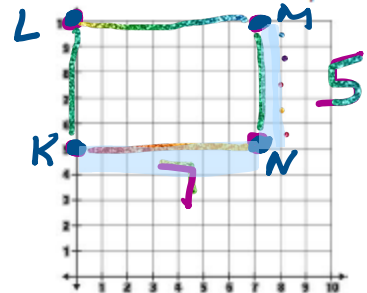
6 Find the area of a triangle whose base goes from point (6,1) to (10,1). The endpoints of the height are (6,1) and (6,7)



7 Find the perimeter and area of the rectangle with the following vertices: K (0,5) L (0,10) M(7,10) N(7,5) Then, plot the points on the grid and count to check,

Perimeter: $2(7+5)$
 $2(12) = \boxed{24}$

Area: $7 \times 5 = \boxed{35}$



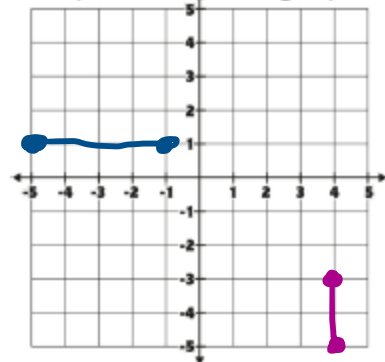
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Distance in All 4 Quadrants

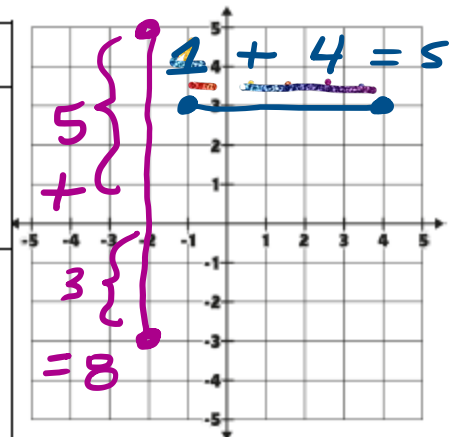
- It is possible to find the length of a horizontal or vertical line drawn in a coordinate plane.
- One way you can find the length is by plotting points, drawing the line and counting to find the length.
- You can find the length of any vertical or horizontal line in the same quadrant by using the coordinates of the endpoints.
- The endpoints of horizontal lines have the same y-value and different x-coordinates.
- To find the distance between the endpoints of a horizontal line, subtract the absolute values of the x-values. *SAME QUADRANT*
- The endpoints of vertical lines have the same x-values and different y-coordinates.
- To find the distance between the endpoints of a vertical line, subtract the absolute values of the y-values. *SAME QUADRANT*
- Find the length of each line using subtraction. Then plot the points on the graph and check by counting.

Endpoints	Work	Length
(4,-3) (4,-5)	$ -5 - -3 $ $5 - 3 =$	2 UNITS
(-5,1) (-1,1)	$ -5 - 1 $ $5 - 1 =$	4 units



- You can find the length of a horizontal or vertical line segment across two quadrants.
- To find the length of a vertical line segment, find the SUM of the absolute values of y-coordinates. (add)
- To find the length of a horizontal line segment, find the sum of the absolute values of x-values.

Endpoints	Work	Length
(-1, 3) (4,3)	$ -1 + 4 $ $1 + 4 =$	5 UNITS
(-2,-3) (-2,5)	$ -3 + 5 $ $3 + 5 = 8$	8 UNITS



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Practice: Distance in All 4 Quadrants

#1 Find the length of a line with the following endpoints: A (1,8) B (6,8)

BOTH Positive, Same Quadrant

$$6 - 1 = \boxed{5}$$

#2 Find the length of a line with the following endpoints: C (-5,-5) D (-5,-11)

Same signs (both negative) Same quadrant

$$|-11| - |-5| \\ 11 - 5 = \boxed{6}$$

#3 Find the length of a line with the following endpoints: E (-2,15) F (-2,-10)

Different signs, different Quadrant

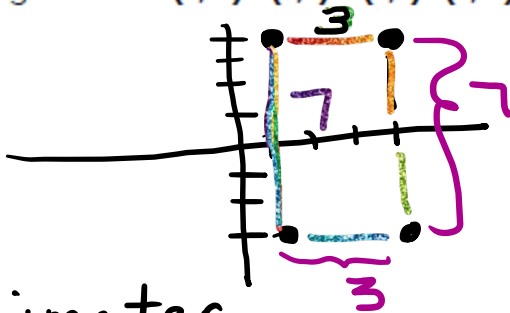
$$|15| + |-10| \\ 15 + 10 = \boxed{25}$$

#4 Find the length of a line with the following endpoints: G (-14,20) H (-14,-35)

Different signs - different Quadrants

$$|-35| + |20| \\ 35 + 20 = \boxed{55}$$

#5 Find the perimeter of a rectangle with the following vertices: A (1,-3) B (4,4) C (4,4) D(4,-3)



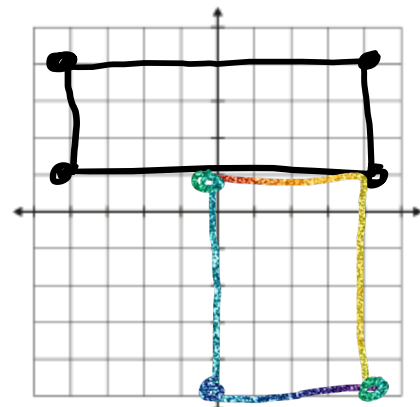
perimeter $2(3+7) = 2(10) = \boxed{20}$

#6 Find the area of a triangle whose base goes from point (-5,2) to (2,2). The endpoints of the height are (0,2) and (0,6)

ignore for now

#7 What could the vertices of a rectangle be with an area of 24 units². Sketch a graph of your figure.

Area of 24
1 x 24
2 x 12
3 x 8
4 x 6



HOMEWORK Side 1

Name: _____

Date: _____

★GEOMETRY★

SCORE:

____ / 10

DISTANCE IN THE COORDINATE PLANE

Answer each question.

1 Find the length of a line with the following endpoints: A (0,5) B (0,10)	2 Find the length of a line with the following endpoints: C (2,4) D (2,16)
3 Find the length of a line with the following endpoints: E (20,5) F (32,5)	4 Find the length of a line with the following endpoints: G (25,16) H(17,16)
5 Find the length of a line with the following endpoints: I (14,0) J (28,0)	6 Find the length of a line with the following endpoints: K (24,26) L(24,25)
7 Find the length of a line with the following endpoints: M (12,1) N (32,1)	8 Find the perimeter of a rectangle with the following vertices: A (2,2) B (2,8) C (5,8) D(5,2)
9 Find the perimeter of a square with the following vertices: E (0,0) F (10,0) G (10,10) H(0,10)	10 Find the length of a line with the following endpoints: P (4,55) Q (4,95)

Homework side 2

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Date: _____

DISTANCE IN THE COORDINATE PLANE ALL 4 QUADRANTS

★GEOMETRY★

SCORE:

____ / 10

Answer each question.

1 Find the length of a line with the following endpoints: A (0,-5) B (0,-10)	2 Find the length of a line with the following endpoints: C (2,-6) D (2,20)
3 Find the length of a line with the following endpoints: E (2,4) F (-2,4)	4 Find the length of a line with the following endpoints: G (20,3) H(-10,3)
5 Find the length of a line with the following endpoints: I (24,0) J (28,0)	6 Find the length of a line with the following endpoints: K (-4,12) L(-4,6)
7 Find the length of a line with the following endpoints: M (-12,1) N (3,1)	8 Find the perimeter of a rectangle with the following vertices: A (-2,2) B (-2,0) C (3,0) D(3,2)
9 Find the perimeter of a square with the following vertices: E (-3,-3) F (-2,-3) G (1-2,-4) H(-3,-4)	10 Find the length of a line with the following endpoints: P (-6, 75) Q (-6,-20)