Get a sheet of graph paper.

Plot each pair of points and connect them.
Find the length of each segment.

Length of segment:

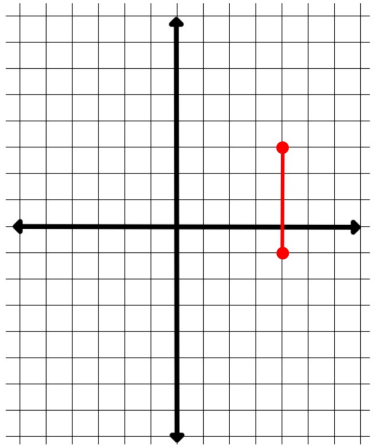
1. (4,3) and (4,-1)

2. (-5,2) and (4,2)

3. (-2,3) and (4,-5)

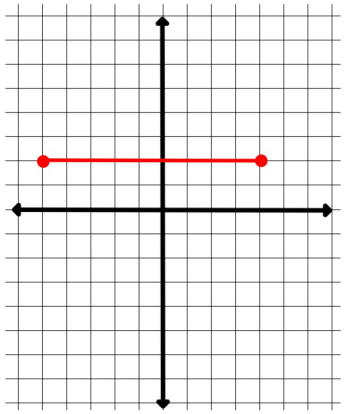
1. (4,3) and (4,-1)

Length of segment = 4



2. (-5,2) and (4,2)

Length of segment = 9



A segment is horizontal if the y-coordinates are the same.

If a segment is horizontal you can find its length by:

1. Counting the number of boxes between the endpoints.

2. Find the difference in the x-coordinates.

A segment is vertical if the x-coordinates are the same.

If a segment is Vertical you can find its length by:

1. Counting the number of boxes between the endpoints.

2. Find the difference in the y-coordinates.

If a segment is neither horizontal or vertical you can't just count to find its length.

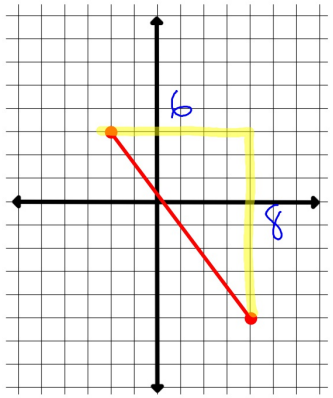
3. (-2,3) and (4,-5)

Length of segment = 10

To find the length of this segment you can form a right triangle and use the Pythagorean Theorem.

$6^2 + 8^2 = x^2$

$10 = x$



How would you find the distance between each pair of points?

1. (43,75) and (48,63)

2. (1.05, -2.96) and (8.44, 0.53)

If you don't want to or can't plot the points to form a right triangle to find the length of a segment you can use the

DISTANCE FORMULA

The Distance Formula:

The distance between any two points

(x_1 , y_1) and (x_2 , y_2)

is: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Use the Distance Formula to find the distance between each pair of points. Round to the nearest tenth where needed.

1. (7,-3) and (-6,2) $= \sqrt{13^2 + 5^2} = \sqrt{194} = 13.9$ ($13^2 = 169$, $+25$)

2. (2,4) and (-6, -10) $= \sqrt{8^2 + 14^2} = \sqrt{260} = 16.1$ ($64 + 196$)

3. (11,7) and (11, 2) $= 5$ ($7 - 2$)

3. (-9,7) and (3,7)

Use the Distance Formula to find the EXACT distance between this pair of points.

(-3,1) and (3,5)

$d = \sqrt{6^2 + 4^2}$

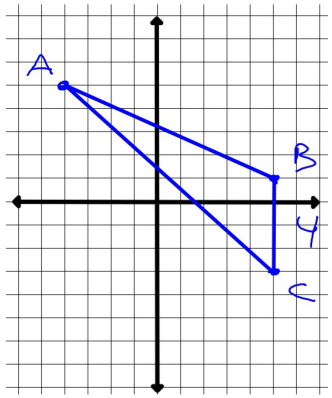
$\sqrt{36 + 16} = \sqrt{52}$

$\sqrt{4 \cdot 13}$

$= 2\sqrt{13}$

Plot these three points to create triangle ABC. Find the perimeter of this triangle. Round to a tenth if necessary.

A (-4,5) B (5,1) C (5,-3)



AB = $\sqrt{9^2+4^2}$ = 9.8

BC = 4

CA = $\sqrt{9^2+8^2}$ = 12.0

25.8

Your two best friend's favorite numbers are 5 and 37 and that is what number they got on their uniform. Your favorite number is already taken so you decided to get the number that is exactly halfway between your friend's numbers.

What number should you get?

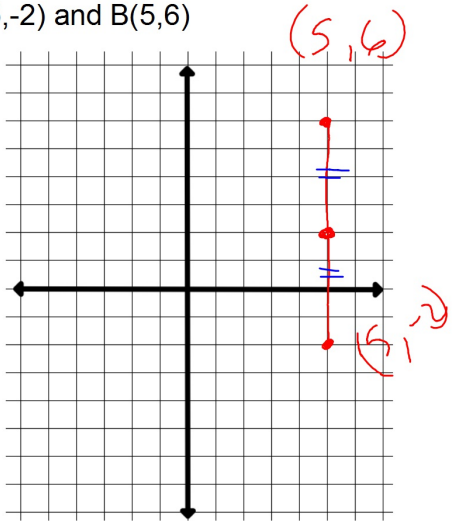
$\frac{5+37}{2}$ → 21

A number that is exactly in the middle of two other numbers is called their MEAN or AVERAGE.

Plot the following points: A (5,-2) and B(5,6)

What point is exactly in the middle of these two points?

(5, 2)

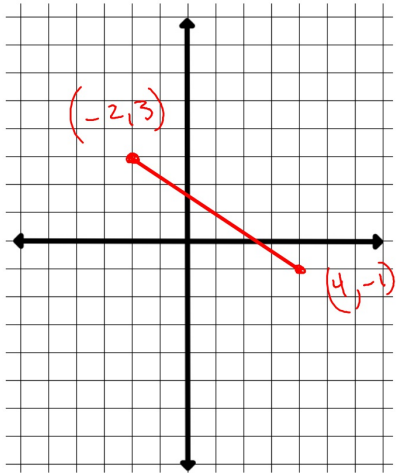


Plot the following points: A (-2,3) and B(4, -1)

What point is exactly in the middle of these two points?

$\left(\frac{-2+4}{2}, \frac{3+-1}{2}\right)$

(1, 1)



The point that is exactly the middle point between two other points is called the MIDPOINT.

This point divides a segement into two equal segments.

MIDPOINT FORMULA:

The midpoint M of a segment whose endpoints are $A(x_1 , y_1)$ and $B(x_2 , y_2)$ is

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$