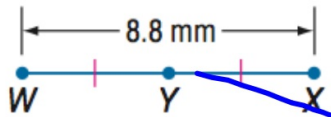


## Geometry - BELL WORK

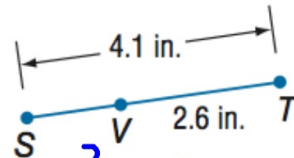
Find the measurement of each segment.

1)  $\overline{WY}$



$$\frac{8.8}{2} = 4.4 \text{ mm}$$

2)  $\overline{SV}$



$$\begin{array}{r} 4.1 \\ - 2.6 \\ \hline 1.5 \end{array}$$

## 1-3 Distance and Midpoints

We have:

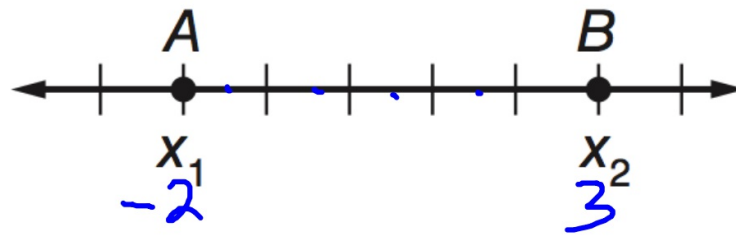
Measured segments and found unknown segment lengths.  
Graphed on the coordinate plane.

Today we will:

Find the distance between two points.  
Find the midpoint of a segment.

G-CO: Experiment with transformations in the plane.

Distance between two points on the number line:



$$AB = |x_1 - x_2| \text{ or } |x_2 - x_1|$$

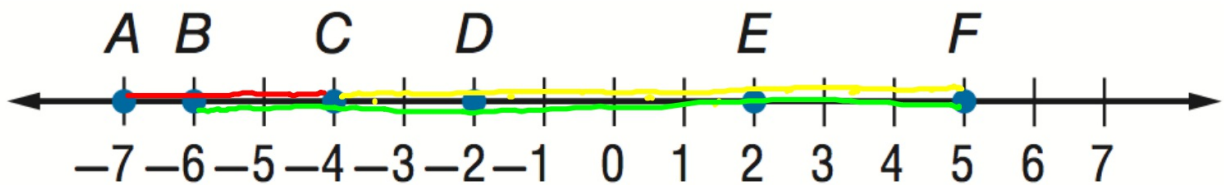
$$|-2 - 3|$$

$$|-5| = 5$$

The distance is the difference between the two numbers.

$$|3 - (-2)| =$$

$$|5| = 5$$



Use the number line to find each measure.

1)  $AC = 3$

$$|-7 - (-4)| = |-3|$$

2)  $CF = 9$

$$|-4 - 5| = |-9|$$

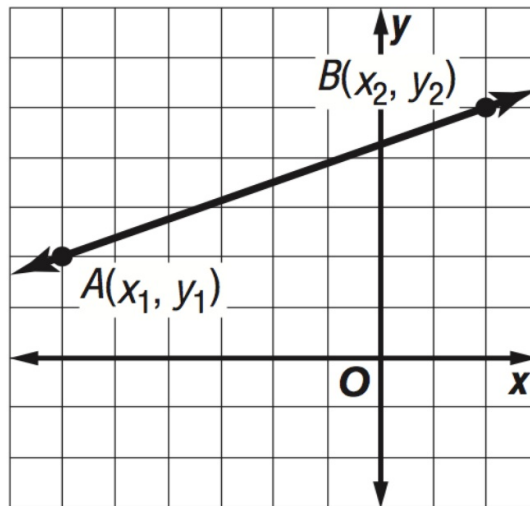
3)  $FB = 11$

$$|5 - (-6)| = |11|$$

To find the distance between two points on the coordinate plane, we use the distance formula:

Distance Formula:

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



Find the distance between C(-4, -6) and D(5, -1)

$x_1$   $y_1$        $x_2$   $y_2$

Distance Formula:

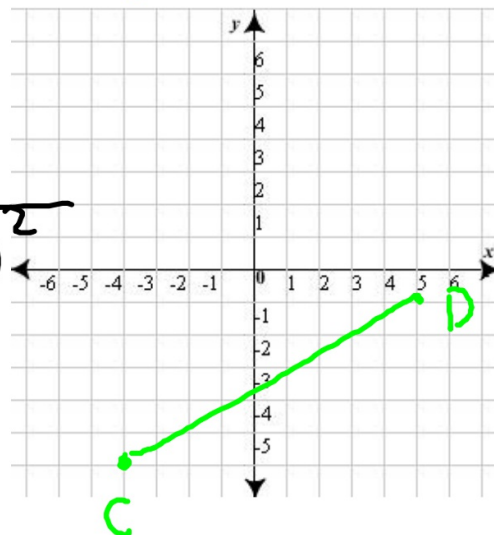
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(5 - (-4))^2 + (-1 - (-6))^2}$$

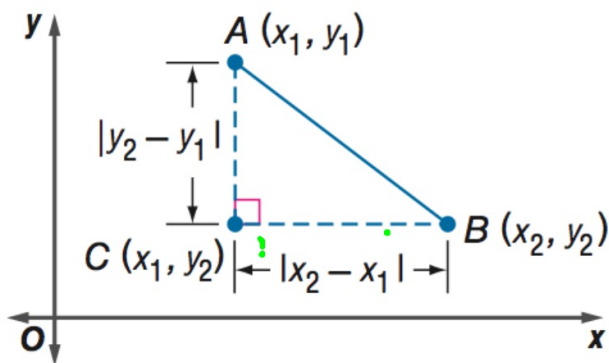
$$\sqrt{(9)^2 + (5)^2}$$

$$\sqrt{81 + 25}$$

$$d = \sqrt{106} \approx 10.3$$

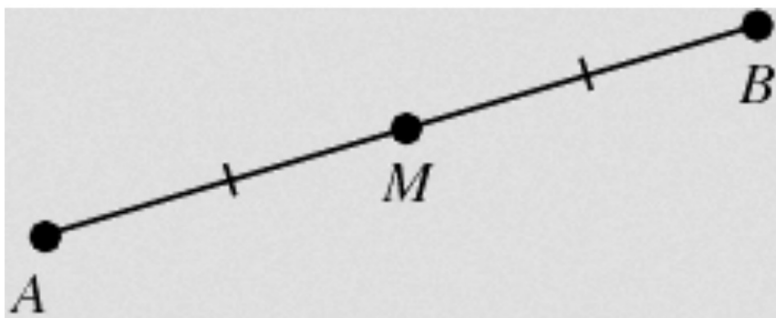


Notice, the distance formula is just the Pythagorean Theorem!

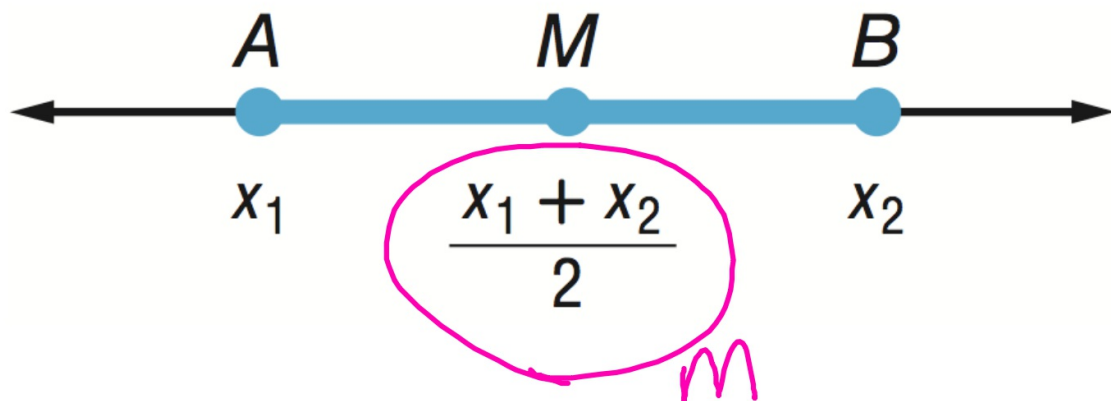


$$\begin{aligned}(CB)^2 + (AC)^2 &= (AB)^2 \\ (|x_2 - x_1|)^2 + (|y_2 - y_1|)^2 &= (AB)^2 \\ (x_2 - x_1)^2 + (y_2 - y_1)^2 &= (AB)^2 \\ \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} &= AB\end{aligned}$$

The **midpoint** of a line segment is the point halfway between the endpoints.



## Midpoint Formula (on Number Line)



The midpoint is the **average** of the two points.

**TEMPERATURE** The temperature on a thermometer dropped from a reading of  $25^\circ$  to  $-8^\circ$ . Find the midpoint of these temperatures.

$$\frac{25 + (-8)}{2} = \frac{17}{2} = 8.5^\circ$$