

Monday, 8/25/14

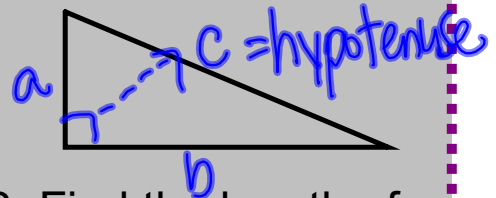
1. Take out vocab prep
2. Complete Warm up
3. Notes: Section 1.3

HW: See board

Warm - Up

1. $a^2 + b^2 = \underline{c^2}$

2. label the sides of the right triangle with a, b, and c:



3. Find the length of the hypotenuse if $a = 3$ and $b = 4$.

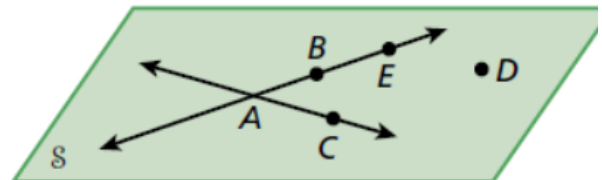
POINTS, LINES, PLANES MINI QUIZ

I. Fill in the Blank: Use the word bank below to fill in the blank with each correct vocabulary term. Not all terms will be used.
(0.5 point each)

1. A _____ extends forever in opposite directions and has no length.
2. Points that lie in the same plane are considered _____.
3. A _____ is an imaginary flat surface that extends forever.
4. A _____ is a figure that has a starting point but no ending point.

II. Notation: For problems 8-14 Use the figure at the right.

5. Name 3 collinear points: _____, _____, _____
6. Name a line segment: _____
7. Give another name for plane BEC: _____
8. Name a ray: _____
9. Name the intersection between the two lines: _____
10. Name 2 non-collinear points: _____, _____



Section 1.3: Distance and Midpoint

Content Standards

G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).

Objectives

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

KeyConcept Distance Formula (on Number Line)

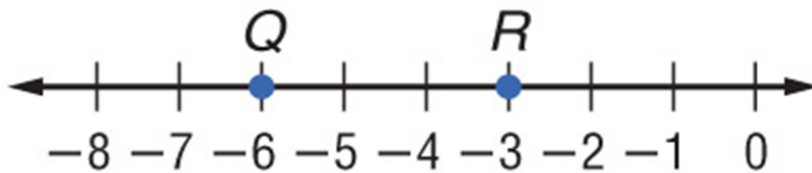
Words The distance between two points is the absolute value of the **difference** between their coordinates.

Symbols If P has coordinate x_1 and Q has coordinate x_2 , $PQ = |x_2 - x_1|$ or $|x_1 - x_2|$.

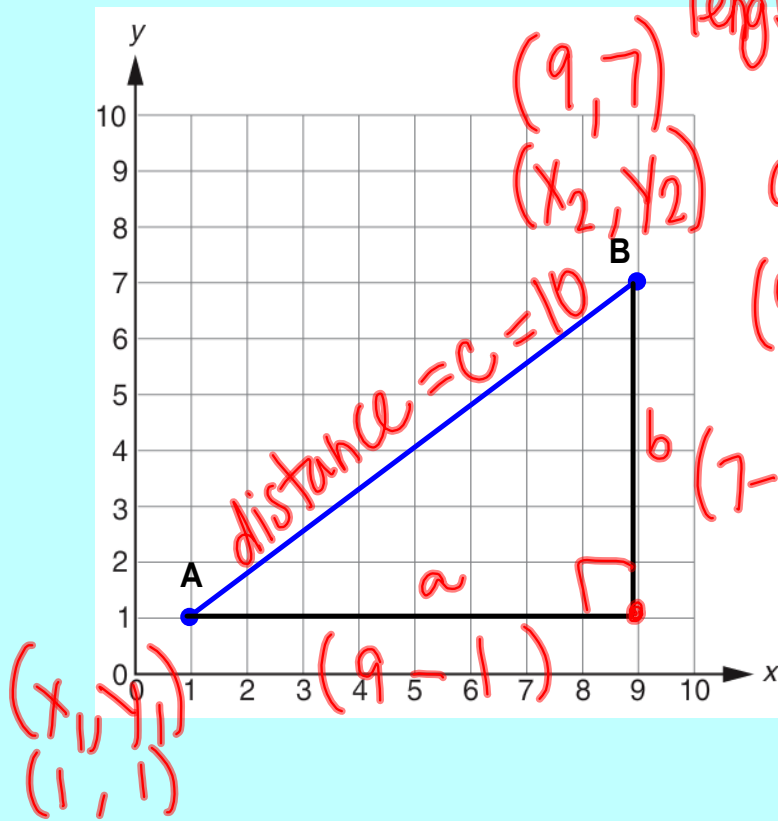


subtract

Use the number line to find QR .



How could you find the distance between points **A** and **B**?



length of AB

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

$$(8)^2 + (6)^2 = c^2$$

$$64 + 36 = c^2$$

$$\sqrt{100} = \sqrt{c^2}$$

$$c = 10$$

KeyConcept Distance Formula (in Coordinate Plane)

If P has coordinates (x_1, y_1) and Q has coordinates (x_2, y_2) , then

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

$C = \sqrt{a^2 + b^2}$

$a \leftarrow x_2 - x_1$

$b \leftarrow y_2 - y_1$

EX. 1

Find the distance between $E(-4, 1)$ and $F(3, -1)$

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

$$\sqrt{a^2 + b^2} = c$$

$$EF = \sqrt{7^2 + 2^2}$$

$$= \sqrt{49 + 4}$$

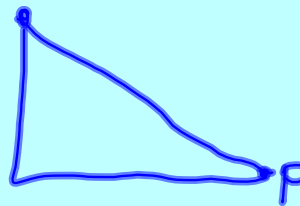
$$= \sqrt{53}$$

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

$$b = -1 - 1 = |-2| = 2$$

EX. 2

Find the distance between $A(-3, 4)$ and $B(1, 2)$



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

*no longer looking at lengths

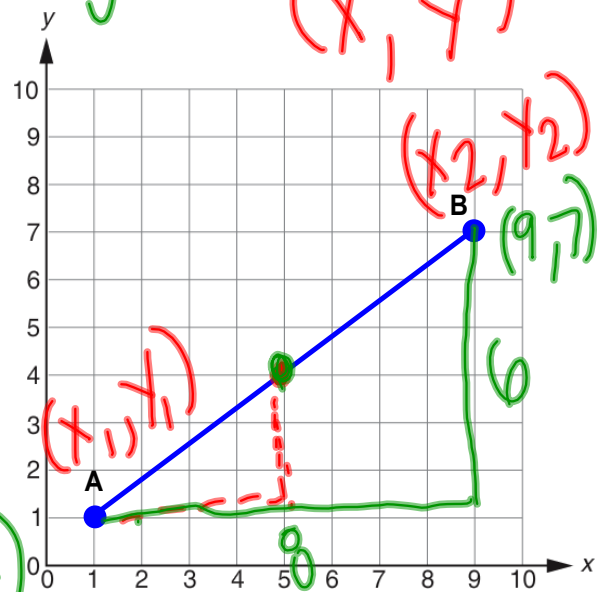
Estimate:

Where do you think the midpoint of AB is located? $(5, 4)$

How could we find the midpoint mathematically?

$$\left(\frac{1+9}{2}, \frac{1+7}{2} \right) = (5, 4)$$

↑
average x & y-coord. $(1, 1)$

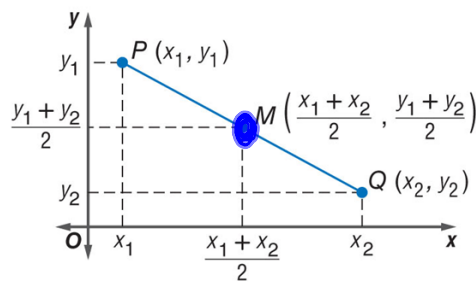


KeyConcept Midpoint Formula (in Coordinate Plane)

If \overline{PQ} has endpoints at $P(x_1, y_1)$ and $Q(x_2, y_2)$ in the coordinate plane, then the midpoint M of \overline{PQ} has coordinates

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

↓
point M



Find the coordinates of M , the **midpoint** of \overline{GH} , for $G(8, -6)$, and $H(-14, 12)$.

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

$$M\left(\frac{8+(-14)}{2}, \frac{-6+12}{2}\right) \rightarrow M\left(\frac{-6}{2}, \frac{6}{2}\right) \rightarrow M(-3, 3)$$

↘ average not a measure (location)

↓

Bisect \overline{AB} and label the midpoint M.

1. estimate midpoint

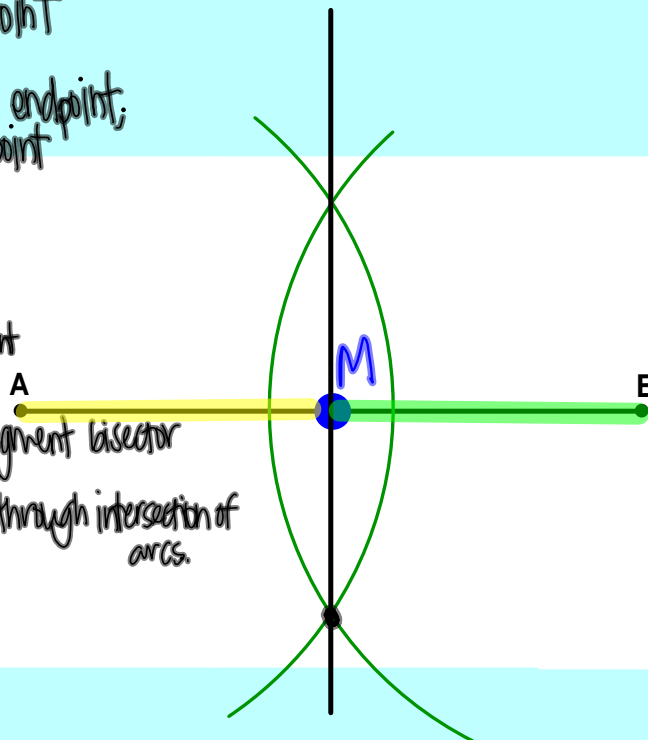
2. put compass on endpoint;
open up past midpoint

3. Draw arc

4. WITHOUT CHANGING
COMPASS, put on point
B.

5. Draw an arc.

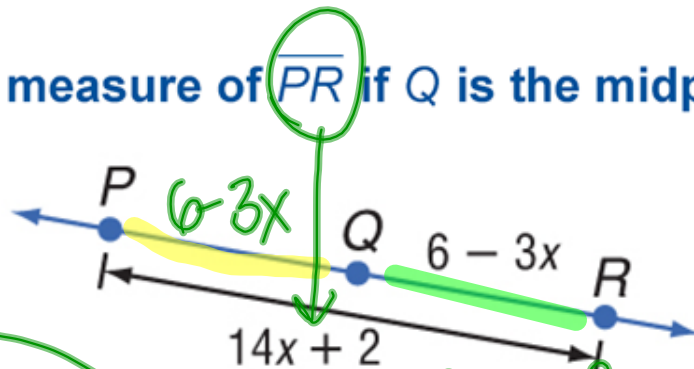
6. segment bisector
passes through intersection of
arcs.



Find the coordinates of D if $E(-6, 4)$ is the midpoint of \overline{DF} and F has coordinates $(-5, -3)$.

$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
 $\left(\frac{-5+x}{2}, \frac{-3+y}{2}\right) = (-6, 4)$
 $\frac{-5+x}{2} = -6$
 $\frac{-3+y}{2} = 4$

What is the measure of \overline{PR} if Q is the midpoint of \overline{PR} ?



$$\overline{PQ} = \overline{QR}$$

$$\overline{PQ} \cong \overline{QR}$$

$$\boxed{PR=9}$$

$$PR = 14\left(\frac{1}{2}\right) + 2$$

$$= 7 + 2 = 9$$

① Solve for x

$$(6-3x) + (6-3x) = 14x+2$$

$$12 - 6x = 14x + 2$$

$$10 = 20x$$

$$x = \frac{1}{2}$$