

**Monday, 8/25/14**

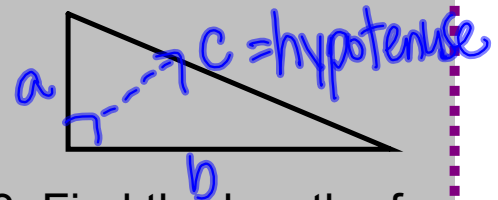
1. Take out vocab prep
2. Complete Warm up
3. Notes: Section 1.3

**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  $b = 4$ .

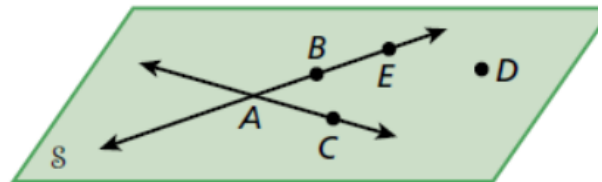
**POINTS, LINES, PLANES MINI QUIZ**

**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)

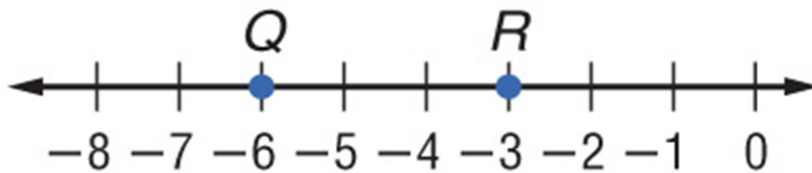
**Words** The distance between two points is the absolute value of the **difference** between their coordinates.

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

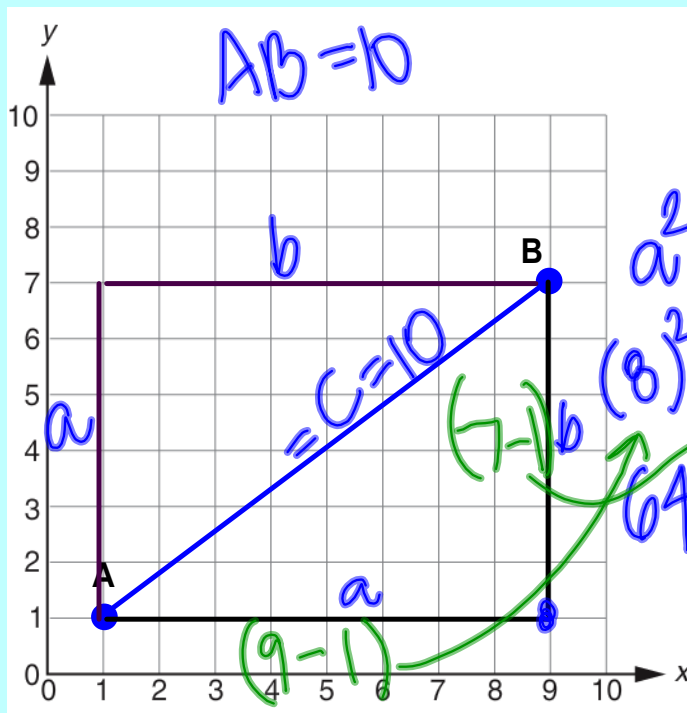


subtract

**Use the number line to find  $QR$ .**



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



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

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

$$64 + 36 = c^2$$

$$100 = c^2 = c \cdot c$$

$$c = 10$$

**KeyConcept** Distance Formula (in Coordinate Plane)

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

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

$c$  = distance from  $P$  to  $Q$

EX. 1

Find the distance between

$E(-4, 1)$  and  $F(3, -1)$

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

$b = -1 - 1 = -2$

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

$= (7)^2 + (-2)^2 = 49 + 4 = 53$

$d = \sqrt{(7)^2 + (-2)^2}$   
 $= \sqrt{53}$

$\boxed{\sqrt{53}}$

EX. 2

Find the distance between

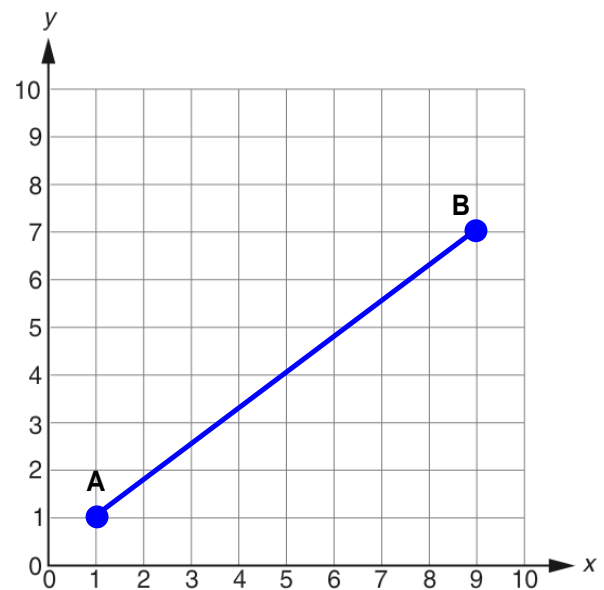
$A(-3, 4)$  and  $B(1, 2)$

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

**Estimate:**

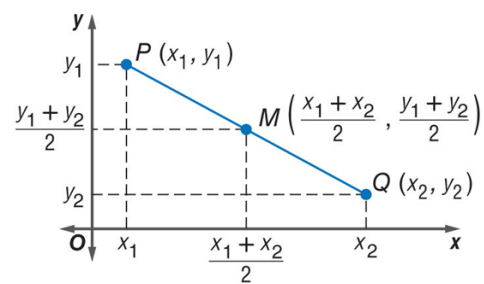
*Where do you think the midpoint of AB is located?*

*How could we find the midpoint mathematically?*



**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



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



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



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

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

