4

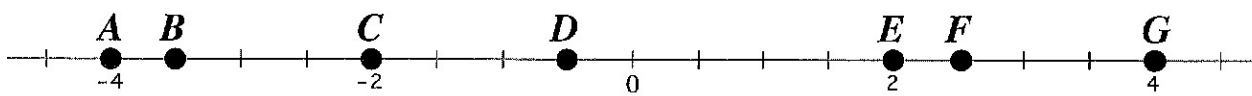> ### READY, SET, GO!   Name   Period   Date

READY

Topic: Finding the distance between two points

Use the number line to find the distance between the given points. (The notation AB means the distance between the points A and B.)
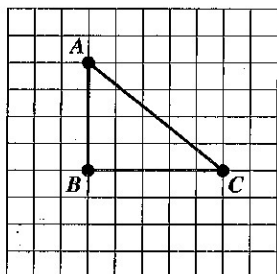
1. AE	2. CF	3. GB	4. CA	5. BF	6. EG
Answer: 6	Answer: 4.5	Answer: 7.5	Answer: 2	Answer: 6	Answer: 2

7. Describe a way to find the distance between two points on a number line without counting the spaces.

   Answer: Subtract the points. If the difference is negative, change it to positive since distance is always positive.

8.

   a. Find AB.   **Answer: 4**

   b. Find BC.   **Answer: 5**

   c. Find AC.   **Answer: $\sqrt{41}$**

9. Why is it easier to find the distance between point A and point B and point B and point C than it is to find the distance between point A and point C?

   Answer: AB and BC are vertical and horizontal segments so all you have to do is count the spaces along the grid lines. A slanted line needs Pythagorean Theorem.

10. Explain how to find the distance between point A and point C.

    Answer: Square the distance of AB and add it to the squared distance of BC. Take the square root of the sum to find the distance of AC.

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SET

Topic: Slope triangles and the distance formula

Triangle ABC is a slope triangle for the line segment AB where BC is the rise and AC is the run. Notice that the length of segment BC has a corresponding length on the y-axis and the length of AC has a corresponding length on the x-axis. The slope formula is written as $m = \frac{y_2 - y_1}{x_2 - x_1}$ where m is the slope.
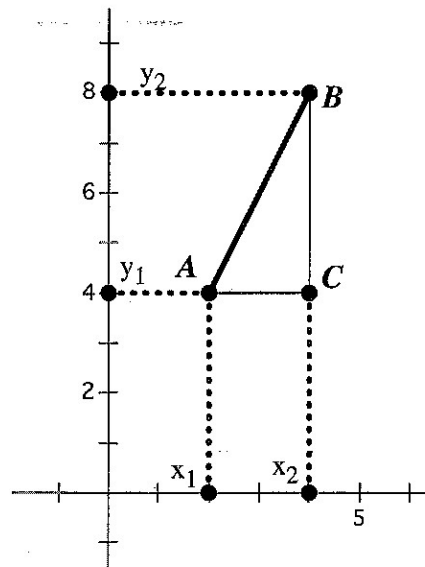
11. a. What does the value $(y_2 - y_1)$ tell you?

Answer: The distance of BC or the rise

b. What does the value $(x_2 - x_1)$ tell you?

**Answer: The distance of AC or the run**

In the previous unit you found the length of a slanted line segment by drawing the slope triangle and then using the Pythagorean theorem on the two sides of the triangle. In this exercise, try to develop a more efficient method of calculating the length of a line segment by using the meaning of $(y_2 - y_1)$ and $(x_2 - x_1)$ combined with the Pythagorean theorem.
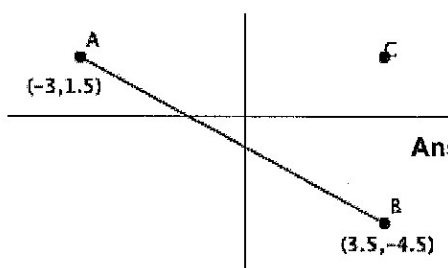
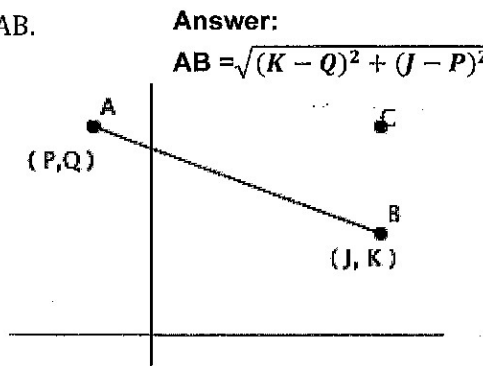12. Find AB.
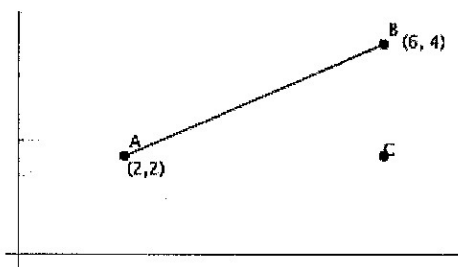
Answer: $\sqrt{20} = 2\sqrt{5}$

13. Find AB.
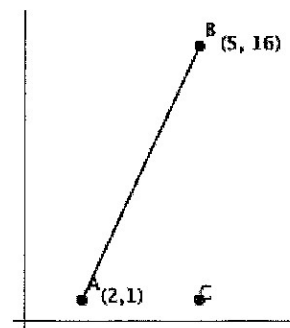
Answer: $\sqrt{234}$

14. Find AB.

Answer: $\sqrt{78.25}$

15. Find AB.

Answer:

$$AB = \sqrt{(K-Q)^2 + (J-P)^2}$$

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GO

Topic: Rectangular coordinates

Use the given information to fill in the missing coordinates. Then find the length of the indicated line segment.
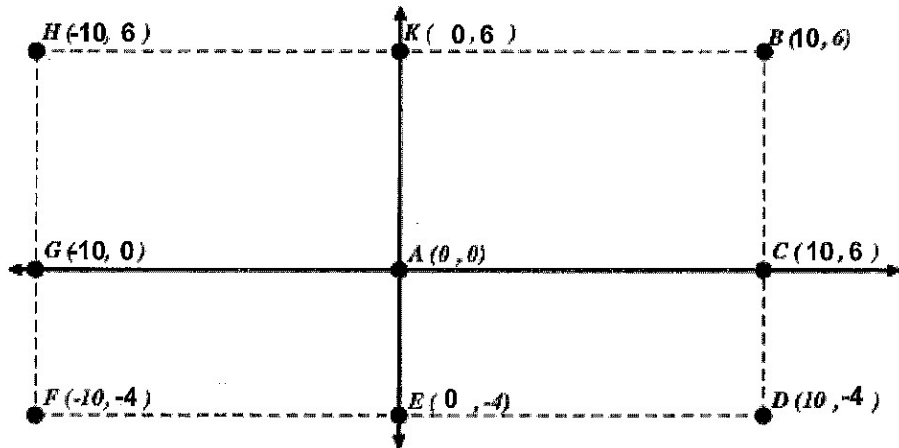
16. a) Find HB.

Answer:
20

b) Find BD.

Answer:
10

H (-10, 6)   K (0,6)   B (10, 6)
G (-10, 0)   A (0 , 0)   C (10,6)
F (-10, -4)   E (0 ,-4)   D (10 ,-4)

17. a) Find DB

Answer:
12

b) Find CF

Answer:
7

D (-8 , 4)   C (0 , 4)   B (4 ,4)
H (-8 , 0)   G (0 , 0)   K (4 ,0)
E (-8 , -3)   F (0 ,-3)   A (4 ,3)

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