Name _____   Date _____   Period: _____

§1.4 Distance

Today we will learn how to find the length of a line segment on a number line and find the distance between two points on a coordinate plane.
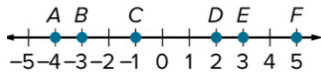
Definitions:

Distance-

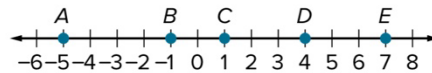**Key Concept • Distance Formula on Number Line**

P ————————————— Q

x_1 x_2

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

Example 1.4.1: Use the number line to find CF.

A B   C   D E   F
−5−4−3−2−1 0 1 2 3 4 5

Example 1.4.2: Use the number line to find AE.

A   B   C   D   E
−6−5−4−3−2−1 0 1 2 3 4 5 6 7 8

Activity 1.4.3: Determine whether CB and DF are congruent.

A B   C   D E   F
−5 −4 −3 −2 −1 0 1 2 3 4 5
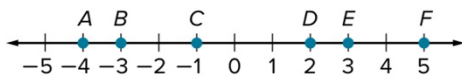
Key Concept • Distance Formula on the Coordinate Plane

If P has coordinates (x_1, y_1) and Q has coordinates (x_2, y_2), then
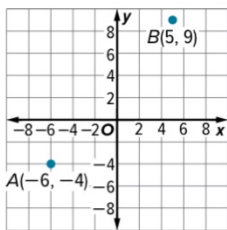$$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}.$$

$Q(x_2, y_2)$

$P(x_1, y_1)$
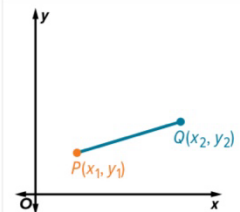
Example 1.4.4: Find the distance between J(4,3) and K(-3,-7).

Activity 1.4.5: Find the distance between A and B.

Example 1.4.6: SNOWBOARDING Manuel wants to go snowboarding with his friend. The closest ski and snowboard resort is approximately 20 miles west and 50 miles north of his house. Manuel picks up his friend who lives 15 miles south and 10 miles east of Manuel's house. How far away are the two boys from the resort?