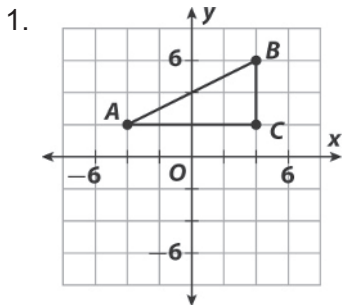


**LESSON**  
**12-3**

# Distance Between Two Points

## Practice and Problem Solving: A/B

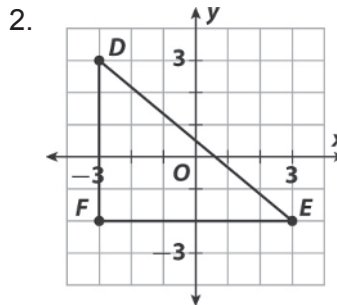
Name the coordinates of the points.



A( \_\_\_\_\_ , \_\_\_\_\_ )

B( \_\_\_\_\_ , \_\_\_\_\_ )

C( \_\_\_\_\_ , \_\_\_\_\_ )



D( \_\_\_\_\_ , \_\_\_\_\_ )

E( \_\_\_\_\_ , \_\_\_\_\_ )

F( \_\_\_\_\_ , \_\_\_\_\_ )

Name the hypotenuse of each right triangle in problems 1 and 2.

3. Hypotenuse in problem 1:

\_\_\_\_\_

4. Hypotenuse in problem 2:

\_\_\_\_\_

Estimate the length of the hypotenuse for each right triangle in problems 1 and 2.

5. Hypotenuse in problem 1:

\_\_\_\_\_

6. Hypotenuse in problem 2:

\_\_\_\_\_

Use the distance formula to calculate the length of the hypotenuse for each right triangle.

7. Hypotenuse in problem 1:

\_\_\_\_\_

\_\_\_\_\_

8. Hypotenuse in problem 2:

\_\_\_\_\_

\_\_\_\_\_

9. Use the distance formula to find the distance between the points  $(-4, -4)$  and  $(4, 4)$ .

\_\_\_\_\_

## Reteach

- 10 in.
- 15 mm
- $3$ ;  $1^2 + 2^2 = 5$ ;  $3^2 = 9$ ; no
- $8$ ;  $6^2 + 7^2 = 85$ ;  $8^2 = 64$ ; no
- $25$ ;  $15^2 + 20^2 = 625$ ;  $25^2 = 625$ ; yes
- $2^2 + 3^2 = 13$ ;  $(\sqrt{13})^2 = 13$
- $3^2 + 6^2 = 45$ ;  $(3\sqrt{5})^2 = 9(5) = 45$

## Reading Strategies

- Answers may vary. Sample answer: "If a right triangle has sides of 5 and 12, then its third side is the square root of 5 squared plus 12 squared, or 13."
- Answers may vary. Sample answer: "If a triangle has sides 4, 4, and 8, then it is not a right triangle because the sum of 4 squared plus 4 squared is 32, which is not equal to 8 squared or 64."

## Success for English Learners

- The sides 7, 24, and 25 can be used to make a right triangle as shown, assuming that the 7 and 24 sides are perpendicular to each other and form a right angle. However, this is an informal proof by observation, not a formal proof using specific numbers from the problem.
- Shorter, since a length longer than 12 would make the square of the hypotenuse ( $12^2 = 144$ ) greater than the sum of the squares of the sides of the sides ( $5^2 + 8^2 = 25 + 64 = 89$ ).

## LESSON 12-3

### Practice and Problem Solving: A/B

- $A(-4, 2)$ ;  $B(4, 6)$ ;  $C(4, 2)$
- $D(-3, 3)$ ;  $E(3, -2)$ ;  $F(-3, -2)$
- $\overline{AB}$
- $\overline{DE}$
- Answers will vary. Sample answer: 9 units.
- Answers will vary. Sample answer: 8 units.

$$7. \overline{AB} = 4\sqrt{5}$$

$$8. \overline{DE} = \sqrt{61}$$

$$9. 8\sqrt{2}$$

### Practice and Problem Solving: C

- $d_{AB} = \sqrt{10}$ ;  $d_{BC} = 3$ ;  $d_{AC} = 1$ ;  $\overline{AB}$  is the hypotenuse, so does  $(\sqrt{10})^2 = 3^2 + 1^2$ ? Yes.
- $AB = 3.5$  km;  $BC = 2.5$  km;  $CA = 2\sqrt{2}$ , so the perimeter is  $6 + 2\sqrt{2}$  or approx. 8.8 km
- $d = \sqrt{(x+5)^2 + (3-7)^2} = \sqrt{(x+5)^2 + 16}$ ; for  $d = 5$ ,  $\sqrt{(x+5)^2 + 16} = 5$  and  $x+5 = 3$ . So  $x = -2$ .
- $d = \sqrt{(6-3)^2 + (y+4)^2} = \sqrt{9 + (y+4)^2}$ ; for  $d = 5$ ,  $\sqrt{9 + (y+4)^2} = 5$  and  $(y+4)^2 = 16$  and  $(y+4) = -4$  and  $y = -8$ .

### Practice and Problem Solving: D

- $2\sqrt{2}$
- $4\sqrt{2}$ ;  $x_2 = -5$ ;  $x_1 = -1$ ;  $y_2 = 7$ ;  $y_1 = 3$ ;  
 $d = \sqrt{(-5+1)^2 + (7-3)^2}$
- $10\sqrt{2}$ ;  $x_2 = 10$ ;  $x_1 = 0$ ;  $y_2 = -15$ ;  $y_1 = -5$ ;  
 $d = \sqrt{(10-0)^2 + (-15+5)^2}$
- Answers will vary.; Sample answer: x-distance between points = 10;  $AB =$  more than 10.
- Answers will vary.; Sample answer: x-distance between points = 5;  $CD =$  more than 5.
- Answers will vary.; Sample answer: x-distance between points = 5;  $EF =$  more than 5.
- Answers will vary.; Sample answer: x-distance between points = 7;  $CD =$  more than 7.
- The difference of the y-coordinates is  $|5 - 1| = 4$ .
- The difference of the y-coordinates is  $|-4 + 1| = 3$ .