

**Lesson #1: The Distance Formula**

You can use the **distance formula** to find the distance between two points in a coordinate plane.

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

- Label the points
- Substitute the values in for the variables
- Evaluate the parenthesis first
- Next evaluate exponents (remember when you square a negative you always get a positive)
- Add the two numbers together
- Then take the square root
- Round your answer to the nearest tenth.

**Find the distance between the two points. Round your solution to the nearest tenth.**

1. (7, -6) and (-1, -6)

distance = \_\_\_\_\_

2. (5, 2) and (5, -4)

distance = \_\_\_\_\_

3. (12, -7) and (-4, 3)

distance = \_\_\_\_\_

4. (0, 4) and (4, 5)

distance = \_\_\_\_\_

5. (-2, 0) and (2, 8)

distance = \_\_\_\_\_

6. (3, 7) and (-5, -9)

distance = \_\_\_\_\_

## **Lesson #2: The Midpoint Formula**

You can use the **midpoint formula** to find the midpoint of a line segment in a coordinate plane.

The **midpoint** of a line segment is the point on the segment that is equidistant (the same distance) from its endpoints.

**Midpoint** can also be thought of as an average.

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

- Label the points
- Substitute the values in for the variables
- Add the values in the numerator first; then divide the numerators by 2
- Write your answer as an ordered pair (x, y); this is your midpoint!

### **Find the midpoint of the line segment connecting the given points.**

**7.** (7, -6) and (-1, -6)

midpoint \_\_\_\_\_

**8.** (5, 2) and (5, -4)

midpoint \_\_\_\_\_

**9.** (12, -7) and (-4, 3)

midpoint \_\_\_\_\_

**10.** (0, 4) and (4, 5)

midpoint \_\_\_\_\_

**11.** (-2, 0) and (2, 8)

midpoint \_\_\_\_\_

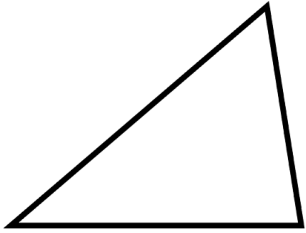
**12.** (3, 7) and (-5, -9)

midpoint \_\_\_\_\_

**Lesson #3: Classify a triangle as scalene, isosceles, or equilateral**

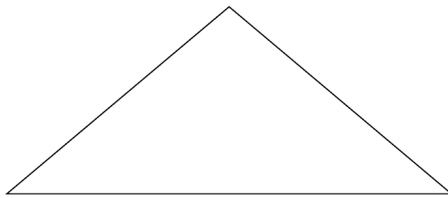
Remember what you know about each triangle:

Scalene Triangle



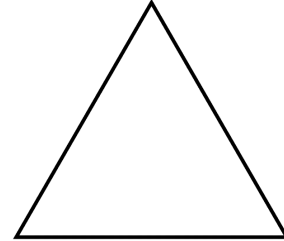
All 3 sides different lengths

Isosceles Triangle



2 sides the same length

Equilateral Triangle



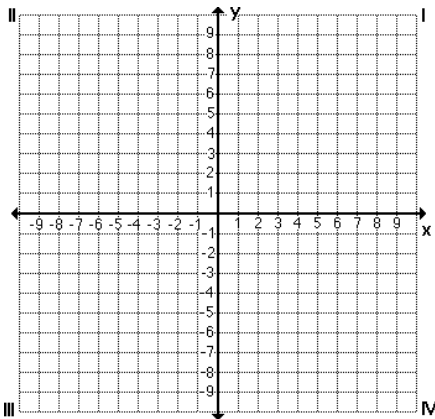
All 3 sides the same length

- Plot the three points and draw the triangle
- Use the distance formula to find the length of each side
- Determine if the triangle is scalene, isosceles, or equilateral

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

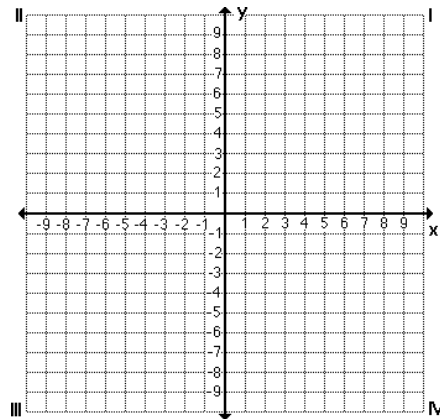
**Your Turn to Practice: Solve the equation for y.**

13. A(2, 7) B(4, 4) C(-1, -1)



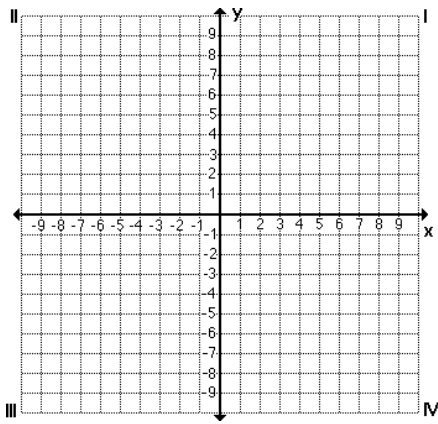
AB=\_\_\_\_\_ BC=\_\_\_\_\_ AC=\_\_\_\_\_  
Classify Triangle=\_\_\_\_\_

14. A(-2, 5) B(-1, -4) C(7, 4)



AB=\_\_\_\_\_ BC=\_\_\_\_\_ AC=\_\_\_\_\_  
Classify Triangle=\_\_\_\_\_

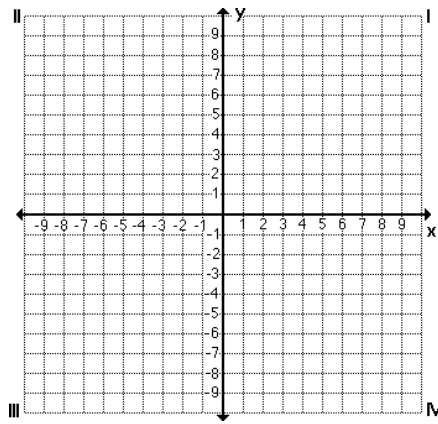
15. A(1, 6) B(2, 5) C(2, 7)



AB= \_\_\_\_\_ BC= \_\_\_\_\_ AC= \_\_\_\_\_

Classify Triangle= \_\_\_\_\_

16. A(1, 3) B(-3, 1) C(2, 2)



AB= \_\_\_\_\_ BC= \_\_\_\_\_ AC= \_\_\_\_\_

Classify Triangle= \_\_\_\_\_