

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class: \_\_\_\_\_

HW#: 26

<b>The Distance Formula</b>	To calculate the distance $d$ of a line segment with endpoints $(x_1, y_1)$ and $(x_2, y_2)$ use the formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ .
<b>The Midpoint Formula</b>	To calculate the midpoint of a line segment with endpoints $(x_1, y_1)$ and $(x_2, y_2)$ use the formula $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ .

### Examples

- a. Find the distance between (2, 3) and (6, 8).

Let  $x_1 = 2$ ,  $x_2 = 6$ ,  $y_1 = 3$ , and  $y_2 = 8$ .

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

$$d = \sqrt{(6 - 2)^2 + (8 - 3)^2}$$

$$d = \sqrt{4^2 + 5^2}$$

$$d = \sqrt{16 + 25}$$

$$d = \sqrt{41} \text{ or } 6.4 \text{ units}$$

- b. Find the midpoint of (5, 1) and (-1, 5).

Let  $x_1 = 5$ ,  $x_2 = -1$ ,  $y_1 = 1$ , and  $y_2 = 5$ .

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

$$\left(\frac{5 + (-1)}{2}, \frac{1 + 5}{2}\right) \quad \text{Substitute.}$$

$$\left(\frac{4}{2}, \frac{6}{2}\right) \quad \text{Add.}$$

(2, 3) is the midpoint

### Practice

Find the distance between each pair of points. Round answers to the nearest hundredth.

1. (4, 6), (1, 5)

2. (15, 4), (10, 10)

3. (-7, -2), (11, 3)

Find the midpoint of the given points.

4. (7, -5), (9, -1)

5. (-8, 4), (3, -4)

6. (-1.8, 1.9), (1.1, 2.8)

7. **Standardized Test Practice** What is the midpoint of the line segment with endpoints (5, -1) and (-9, 7)?

A (2, -3)

B (-2, 3)

C (3, -2)

D (-3, 2)