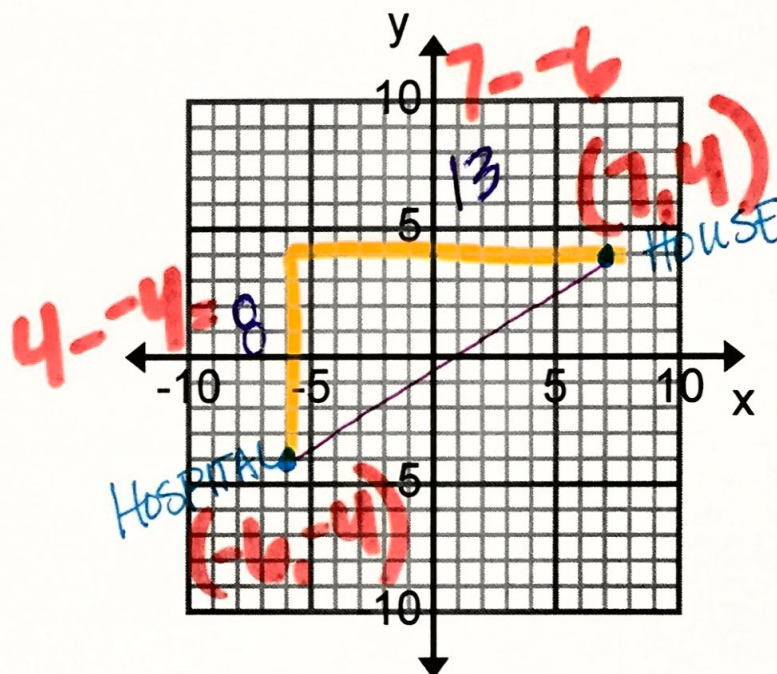


Ex. 1:

You are a 911 operator for the city of Euclid. You receive a phone call and you need to send an ambulance to a house located at the corner of  $(7,4)$  and the hospital is located at  $(-6,-4)$ .

Graph the two points and draw the path that the ambulance will take to reach the house.



a. What is the distance the ambulance will drive from the hospital to the house?

$$8 + 13 = 21 \text{ blocks}$$

b. The dispatcher decided that the distance by ambulance was too far so they decided to dispatch a helicopter. Use the Pythagorean theorem to determine how far away the helicopter is from the house?

$$a^2 + b^2 = c^2$$

$$8^2 + 13^2 = c^2$$

$$64 + 169 = c^2$$

$$\sqrt{233} = c$$

$$\sqrt{233} \approx 15.26 \text{ blocks}$$

Distance Formula:  $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

$$(-6, -4) \quad (7, 4)$$

**Ex. 2:** Use the distance formula to calculate the distance from the hospital to the house. Did the Pythagorean theorem and the distance formula give you the same answer?

$$\begin{aligned} &\sqrt{(-6 - 7)^2 + (-4 - 4)^2} \\ &\sqrt{(-13)^2 + (-8)^2} \\ &\sqrt{169 + 64} \\ &\sqrt{233} \approx 15.26 \end{aligned}$$

**Ex. 3:** Use the distance formula to find the distance for the following ordered pairs:  $(-5, 3)$  and  $(9, -8)$ . Show your work.

$$\begin{aligned} &\sqrt{(-5 - 9)^2 + (3 - -8)^2} \\ &\sqrt{(-14)^2 + (11)^2} \\ &\sqrt{196 + 121} \qquad \sqrt{317} \approx 17.80 \\ &\sqrt{317} \end{aligned}$$

**Ex. 4:** Use the distance formula to find the distance for the following ordered pairs:  $(-20, 12)$  and  $(15, 30)$ . Show your work.

Midpoint Formula:

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

Ex. 5: Find the coordinates of the midpoint of  $\overline{AB}$  with endpoints  $A(-2, 3)$  and  $B(5, -2)$ .

$$\left( \frac{-2+5}{2}, \frac{3+(-2)}{2} \right)$$

$$\left( \frac{3}{2}, \frac{1}{2} \right)$$

Ex. 6: The midpoint of  $\overline{RP}$  is  $M(2, 4)$ . One endpoint is  $R(-1, 7)$ . Find the coordinates of the other endpoint.

$$\frac{x_1 + x_2}{2} = x_M$$

$$P(5, 1)$$

$$\frac{y_1 + y_2}{2} = y_M$$

$$2 \cdot \frac{x + (-1)}{2} = 2 \cdot 2$$

$$\begin{array}{r} x - 1 = 4 \\ +1 \quad +1 \end{array} \quad x = 5$$

$$2 \cdot \frac{y + 7}{2} = 4 \cdot 2$$

$$\begin{array}{r} y + 7 = 8 \\ -7 \quad -7 \\ y = 1 \end{array}$$