



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

1. How far is Pope HS to Walmart?

$$\begin{aligned} &\hookrightarrow (-5, 4) \quad \hookrightarrow (6, 7) \\ &\quad \quad \quad x_1, y_1 \quad \quad \quad x_2, y_2 \\ d &= \sqrt{(6 - (-5))^2 + (7 - 4)^2} = \sqrt{11^2 + 3^2} = \sqrt{121 + 9} = \sqrt{130} \end{aligned}$$

$$d = \sqrt{130} \approx 11.4$$

2. There is a gas station halfway between Pope HS and Chick-fil-A. Where is it located?

$$\begin{aligned} &\hookrightarrow (8, -5) \\ \text{midpoint formula } &\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \\ &\left( \frac{-5 + 8}{2}, \frac{4 + (-5)}{2} \right) = (1.5, -0.5) \end{aligned}$$

3. You want to take your dog to the park that is between Walmart and Chick-fil-A. The parks distance from Walmart to Chick-fil-A can be represented by a ratio  $\frac{a}{b}$  3:1. Where is the park?

$$\begin{aligned} &\text{Walmart } (6, 7) \quad \text{Chick-fil-A } (8, -5) \\ &\quad \quad \quad x_1, y_1 \quad \quad \quad x_2, y_2 \\ &6 + \frac{3}{3+1}(8-6) \quad 7 + \frac{3}{3+1}(-5-7) \\ &6 + \frac{3}{4}(2) \quad 7 + \frac{3}{4}(-12) \end{aligned}$$

$$\text{Park } (7.5, -2)$$

$$\begin{aligned} x_1 + \frac{a}{a+b}(x_2 - x_1) \\ y_1 + \frac{a}{a+b}(y_2 - y_1) \end{aligned}$$