

Warm-up 9: Hyperbola

Write the standard form of the equation of the hyperbola with vertices $(11, -8)$ & $(5, -8)$ and the distance from the center to the focus is 5.

↪ C

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

$$\hookrightarrow \left(\frac{11+5}{2}, \frac{-8+8}{2} \right)$$

$$\text{center } (h, k)$$

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

$$25 = 9 + b^2$$

$$16 = b^2$$

$$b = 4$$

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

$$\frac{(x-8)^2}{9} - \frac{(y+8)^2}{16} = 1$$

