

6) hyperbola, foci $(-3, -7)$ $(-3, 9)$ V: $(3, -4)$ $(-3, 6)$

$$\text{Center is at } \frac{9 + (-7)}{2} = 1 \Rightarrow (3, 1)$$

$$a = 5$$

$$\text{So } \frac{(y-1)^2}{5^2} - \frac{(x+3)^2}{b^2} = 1$$

$$\text{Foci: } (-3, -7), (-3, 9) \Rightarrow$$

$$c = 9 - 1 = 8 \Rightarrow b^2 = 39$$

$$\begin{array}{cc} \uparrow & \uparrow \text{ center} \\ (-3, 9) & (-3, 1) \\ \text{foci} & \end{array}$$

$$\frac{(y-1)^2}{25} - \frac{(x+3)^2}{39} = 1$$