45 Since the foci and vertices lie on the y–axis, the hyperbola has a vertical transverse axis with an equation of the form $\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$. $F(0, \pm 13) \Rightarrow c = 13$ and $V(0, \pm 12) \Rightarrow a = 12$.

$$c^2 = a^2 + b^2 \Rightarrow b^2 = c^2 - a^2 = 169 - 144 = 25 \Rightarrow b = 5$$

The equation of the hyperbola is $\frac{y^2}{144} - \frac{x^2}{25} = 1$, and the asymptotes have the equation $y = \pm \frac{a}{b}x$ or $y = \pm \frac{12}{5}x$. The hyperbola is graphed in *Figure 45*.