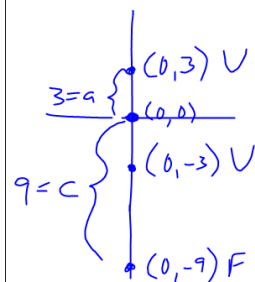


32. The vertices are at  $(0, 3)$  and  $(0, -3)$ , and a focus is at  $(0, -9)$ .



$$\frac{y^2}{9} - \frac{x^2}{72} = 1$$

$$h = 0$$

$$k = 0$$

$$a = 3$$

$$b =$$

$$b^2 = c^2 - a^2$$

$$b^2 = 81 - 9$$

$$b^2 = 72$$

center  $\rightarrow$  midpoint

$$\left( \frac{0+0}{2}, \frac{-3+3}{2} \right) \rightarrow (0, 0)$$

21.  $16y^2 - 25x^2 - 96y + 100x - 356 = 0$

$$16(y^2 - 6y + 9) - 25(x^2 - 4x + 4) = 356 + 16(9) - 25(4)$$

$$\frac{16(y-3)^2}{400} - \frac{25(x-2)^2}{400} = \frac{400}{400}$$

$$\frac{(y-3)^2}{25} - \frac{(x-2)^2}{16} = 1$$

$$h = 2$$

$$k = 3$$

$$a = 5$$

$$b = 4$$

$$c = \sqrt{41}$$

$$16 = c^2 - 25$$

$$41 = c^2$$

center  $(2, 3)$

vertices  $(2, 8)$   $(2, -2)$

foci  $(2, 3 \pm \sqrt{41})$

asymptotes

$$y - 3 = \pm \frac{5}{4}(x - 2)$$

