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

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

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

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

$h = 2$
$k = 3$

$a = 5$
$b = 4$
$c = \sqrt{41}$

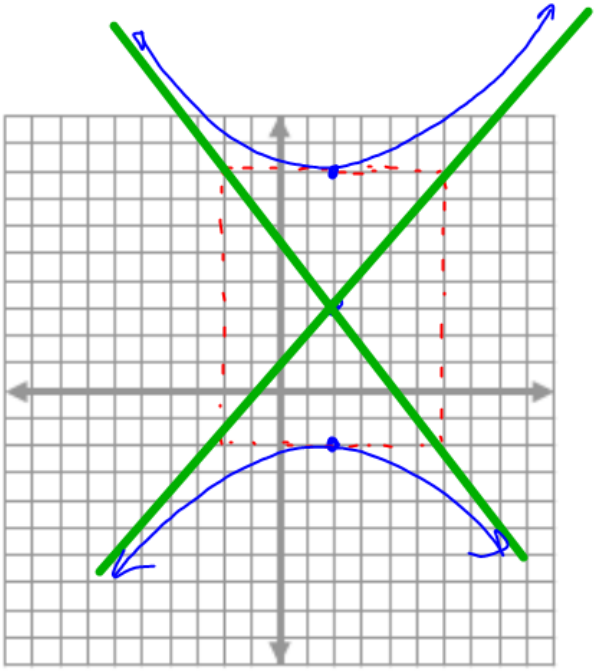
$16 = c^2 - 25$
$41 = c^2$

center $(2, 3)$

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

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

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

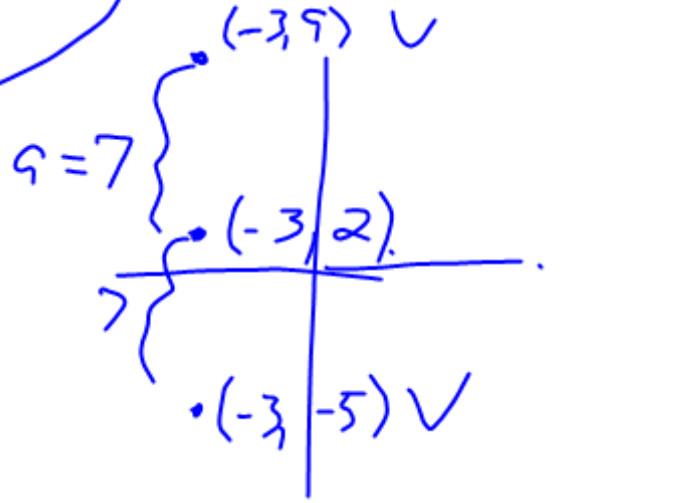


34. The length of the conjugate axis is 8 units, and the vertices are at $(-3, 9)$ and $(-3, -5)$.

$$\frac{(y-2)^2}{49} - \frac{(x+3)^2}{16} = 1$$

$8 = 2b$

$4 = b$



midpoint → center

$$\left(\frac{-3+-3}{2}, \frac{9+-5}{2}\right) = \begin{matrix}(h,k)\\(-3,2)\end{matrix}$$