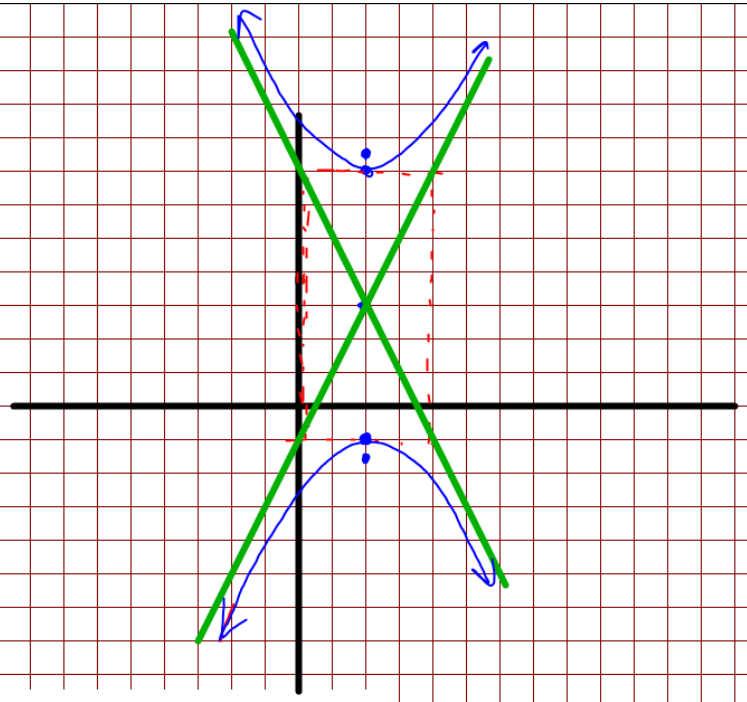


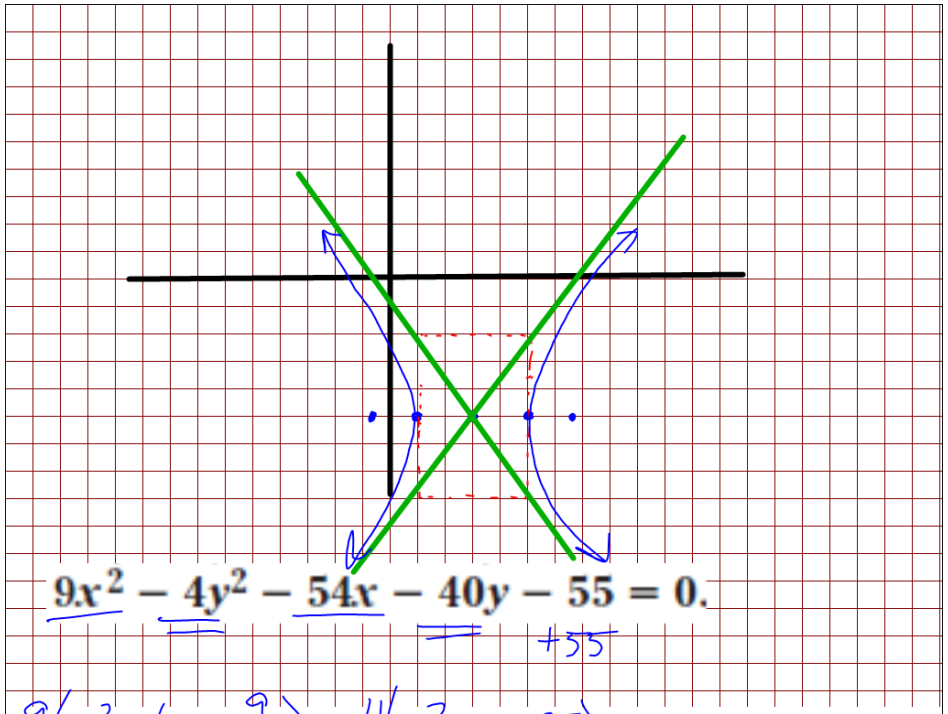
6. $\dfrac{(y-3)^2}{16} - \dfrac{(x-2)^2}{4} = 1$

$h = 2$
$k = 3$
$a = 4$
$b = 2$
$c = 2\sqrt{5}$

$b^2 = c^2 - a^2$
$4 = c^2 - 16$
$\sqrt{20} = \sqrt{c^2}$

center $(2, 3)$
vertices $(2, 7)(2, -1)$
foci $(2, 3 \pm 2\sqrt{5})$
asymptotes
$y - 3 = \pm 2(x - 2)$

$y - k = \pm \frac{a}{b}(x - h)$



$$9x^2 - 4y^2 - 54x - 40y - 55 = 0.$$

$+55$

$$9(x^2 - 6x + 9) - 4(y^2 + 10y + 25) = 55 + 9(9) + -4(25)$$

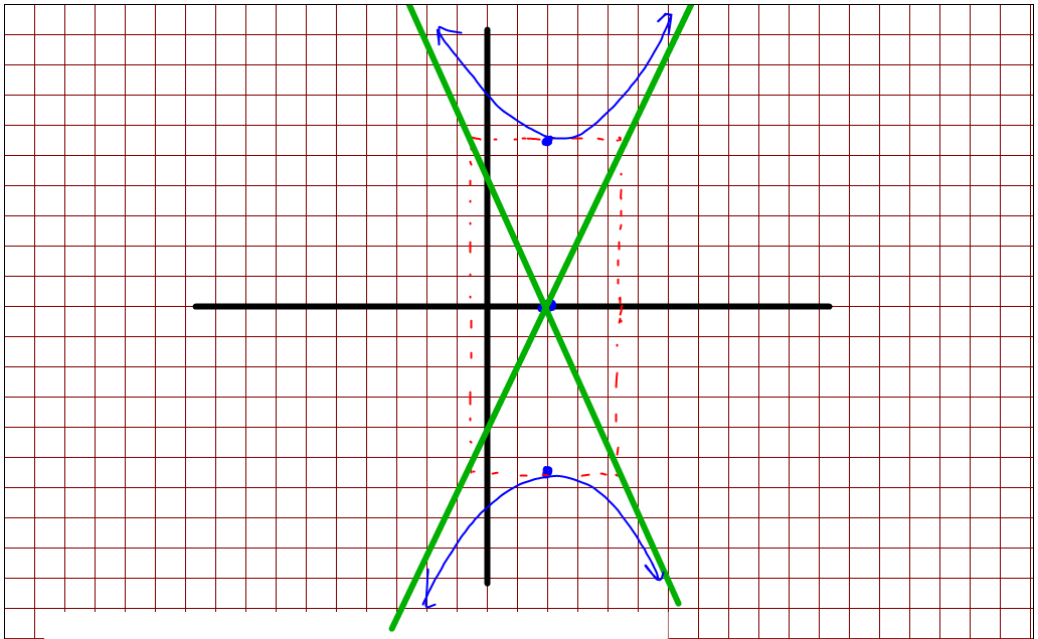
$$\frac{9(x-3)^2}{36} - \frac{4(y+5)^2}{36} = \frac{36}{36}$$

$$\boxed{\frac{(x-3)^2}{4} - \frac{(y+5)^2}{9} = 1}$$

$h = 3$
$k = -5$
$a = 2$
$b = 3$
$c = \sqrt{13}$

$9 = c^2 - 4$
$13 = c^2$

center $(3, -5)$
Vertices $(5, -5)$ $(1, -5)$
asymptotes $y + 5 = \pm\frac{3}{2}(x-3)$
foci $(3 \pm \sqrt{13}, -5)$



7. $y^2 - 5x^2 + 20x = 50$

$y^2 - 5(x^2 - 4x + 4) = 50 - 5(4)$

$\frac{(y-0)^2}{30} - \frac{5(x-2)^2}{30} = \frac{30}{30}$

$\boxed{\frac{y^2}{30} - \frac{(x-2)^2}{6} = 1}$

$h = 2$
$k = 0$
$a = \sqrt{30}$
$b = \sqrt{6}$
$c = 6$

$6 = c^2 - 30$
$36 = c^2$

center $(2, 0)$
vertices $(2, \pm\sqrt{30})$
foci $(2, 6)$ $(2, -6)$
asymptotes
$y = \pm \frac{\sqrt{30}}{\sqrt{6}}(x-2)$
$y = \pm\sqrt{5}(x-2)$