

Transform the equation or inequality by completing the square. Then sketch the graph and include the center, vertices, endpoints, and foci.

1. $25x^2 - 144y^2 - 3600 = 0$

$$\frac{25x^2}{3600} - \frac{144y^2}{3600} = \frac{3600}{3600}$$

$$\frac{x^2}{144} - \frac{y^2}{25} = 1$$

center (0,0)

$r_x = 12$

$r_y = 5$

$r_f = 13$

v: (12,0) (-12,0)

E (0,5) (0,-5)

F (13,0) (-13,0)

$y = \pm \frac{5}{12}x$

2. $25x^2 - 9y^2 + 300x - 126y + 684 = 0$

$$25x^2 + 300x - 9y^2 - 126y = -684$$

$$25(x^2 + 12x + 36) - 9(y^2 + 14y + 49) = -684$$

$$ + 900 $$

$$ - 441$$

$$\frac{25(x+6)^2}{-225} - \frac{9(y+7)^2}{-225} = \frac{-225}{-225}$$

$$\frac{(y+7)^2}{25} - \frac{(x+6)^2}{9} = 1$$

center (-6,-7)

$r_x = 3$

$r_y = 5$

$r_f = \sqrt{34}$

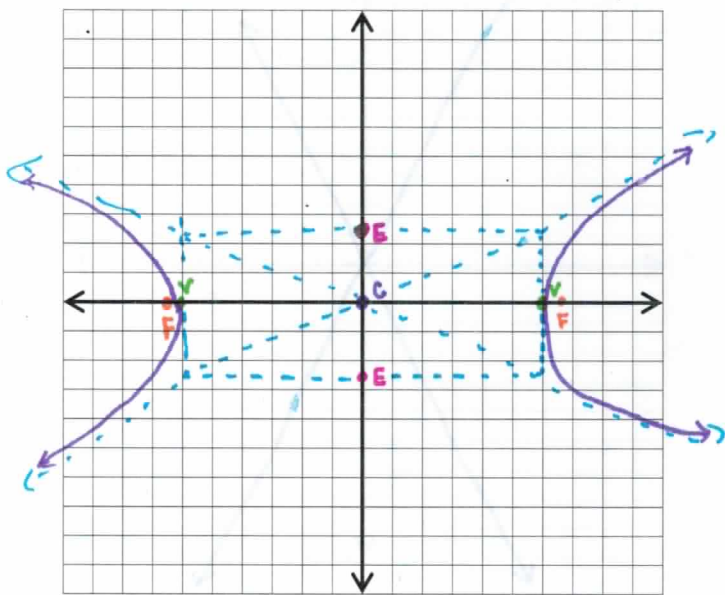
$y+7 = \pm \frac{5}{3}(x+6)$

v (-6,-12) (-6,-2)

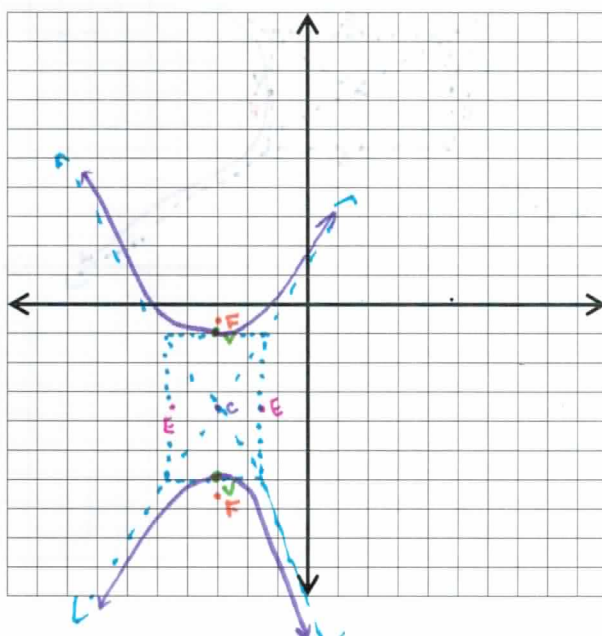
E (-3,-7) (-9,-7)

F (-6,-7+√34) (-6,-7-√34)

by 2's



by 2's



$$3. 4x^2 - 9y^2 + 16x + 108y - 344 = 0$$

$$4x^2 + 16x - 9y^2 + 108y = 344$$

$$4(x^2 + 4x) - 9(y^2 - 12y) = 344$$

$$\frac{4(x+2)^2 - 9(y-6)^2}{36} = \frac{36}{36}$$

$$\frac{(x+2)^2}{9} - \frac{(y-6)^2}{4} = 1$$

$$C(-2, 6)$$

$$r_x = 3 \quad V(-5, 6) (1, 6)$$

$$r_y = 2 \quad E(-2, 4) (-2, 8)$$

$$r_f = \sqrt{13} \quad F(-2 + \sqrt{13}, 6) (-2 - \sqrt{13}, 6)$$

$$y - 6 = \pm \frac{2}{3}(x + 2)$$

$$4. 4x^2 - y^2 = 0$$

$$y^2 = 4x^2$$

$$y = \pm 2x$$

degenerate conic

(2 lines)

