Review Parabolas & Hyperbolas **Name** DiMarco

Directions: For each expanded equation, write down the name of the shape and then put it into standard form.

1. $25x^2 - 4y^2 + 200x - 8y + 796 = 0$ Name: Hyperbola

$25x^2+200x - 4y^2 -8y = -796$

$25(x^2+8x+16) - 4(y^2+2y+1) = -796+400-4$

$\frac{25(x+4)^2}{-400} - \frac{4(y+1)^2}{-400} = \frac{-400}{-400}$

Standard Form: $\frac{(y+1)^2}{100} - \frac{(x+4)^2}{16} = 1$

$\frac{(y+1)^2}{100} - \frac{(x+4)^2}{16} = 1$

2. $x^2 - 4x - 20y - 36 = 0$ Name: Parabola

$x^2 - 4x = 20y + 36$

$x^2 - 4x + 4 = 20y + 36 + 4$

$(x-2)^2 = 20(y+2)$

Standard Form: $(x-2)^2 = 20(y+2)$

3. $-2y^2 + 12y - x - 25 = 0$ Name: Parabola

$-2y^2 + 12y = x + 25$

$-2(y^2 - 6y + 9) = x + 25 - 18$

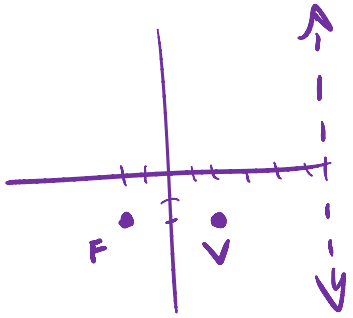
$-2(y-3)^2 = x + 7$

$(y-3)^2 = -\frac{1}{2}(x+7)$

Standard Form: $(y-3)^2 = -\frac{1}{2}(x+7)$

Directions: Write the equation for each conic section described below

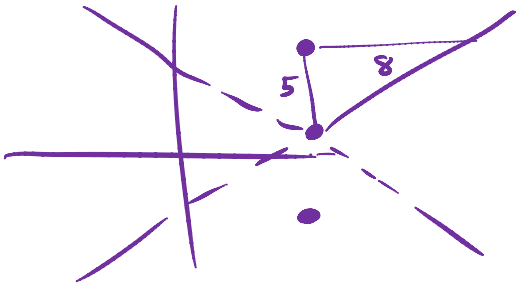
4. A parabola with focus at (-2, -2) and directrix of x = 6



vertex (2, -2)
opens left $-y^2$
$p = 4$
$4p = 16$

$$(y+2)^2 = -16(x-2)$$

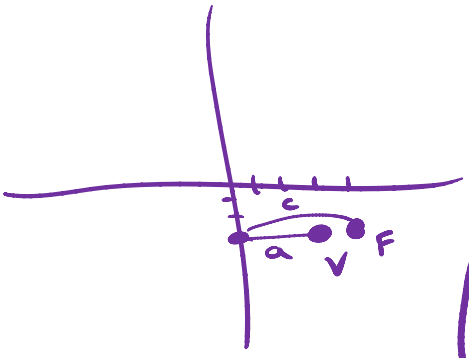
5. An hyperbola with focus points at (7, 7) and (7, -3) and slopes of asymptotes $\pm\frac{5}{8}$.



$2c = 10$
$c = 5$
opens vert.
center (7, 2)
$a = 5$
$b = 8$

$$\frac{(y-2)^2}{25} - \frac{(x-7)^2}{64} = 1$$

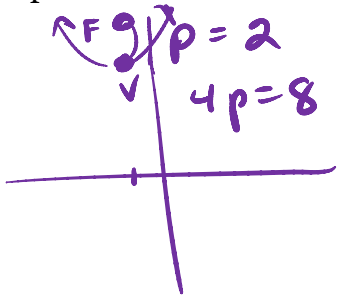
6. An hyperbola with center of (0, -3), one vertex at (3, -3) and a focus at (4, -3).



h k $a = 3$ $c = 4$
opens hor.
$c^2 = a^2 + b^2$
$16 = 9 + b^2$
$7 = b^2$

$$\frac{x^2}{9} - \frac{(y+3)^2}{7} = 1$$

7. A parabola with vertex at (-1, 10) and focus point at (-1, 12).



$p = 2$
$4p = 8$
h k
opens up x^2

$$(x+1)^2 = 8(y-10)$$

Directions: Graph each parabola on the grid given. Identify the vertex, the focus, and the equations of the directrix and axis of summetry.

8. $(y-2)^2 = -12(x-6)$

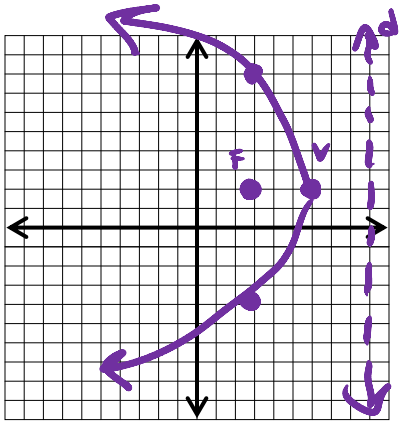
opens left
$4p = 12$
$p = 3$

Vertex: $(6,2)$

Focus: $(3,2)$

Directrix: $x = 9$

Axis of Symmetry: $fw = 12$



9. $10(y+5) = (x-1)^2$

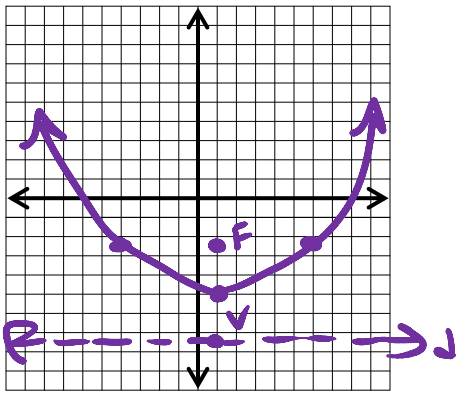
opens up
$4p = 10$
$p = 5/2 = 2.5$

Vertex: $(1,-5)$

Focus: $(1,-2.5)$

Directrix: $y = -7.5$

Axis of Symmetry: $fw = 10$



10. $0 = y^2 + 4y - 3x + 4$

$3x - 4 = y^2 + 4y + 4$
$+4 \quad\quad +4$
$3x = (y+2)^2$

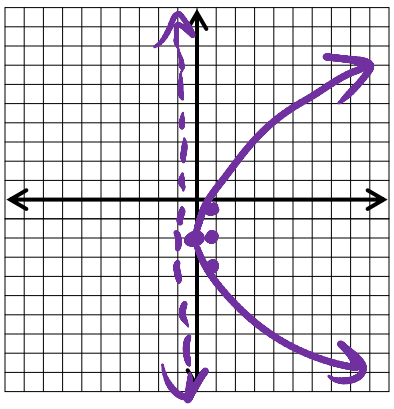
opens right
$4p = 3$
$p = \frac{3}{4}$

Vertex: $(0,-2)$

Focus: $(\frac{3}{4},-2)$

Directrix: $x = -\frac{3}{4}$

Axis of Symmetry: $fw = 3$



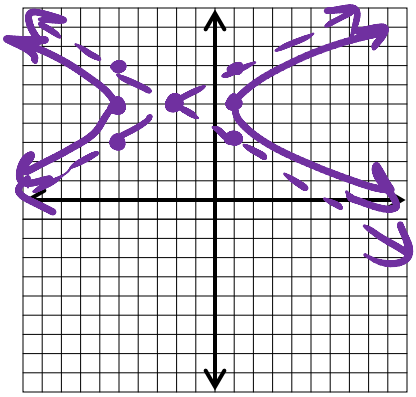
Directions: Graph each hyperbola given and state the focus points and the slopes of the asymptotes.

11. $\left(\frac{x+2}{3}\right)^2-\left(\frac{y-5}{2}\right)^2=1$

center $(-2,5)$
opens hor.
$a=3$
$b=2$
$c^2=a^2+b^2$
$c=\sqrt{13}$

Focus Points: $(-2\pm\sqrt{13},5)$

Slopes of Asymptotes: $\pm\frac{2}{3}$

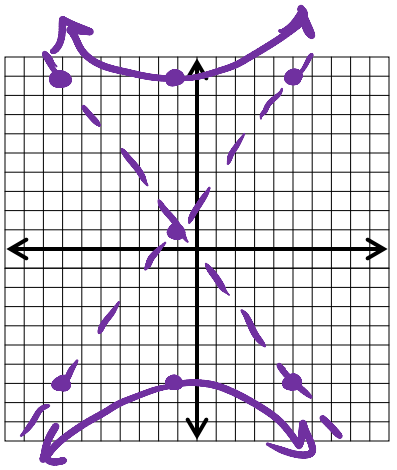


12. $\left(\frac{y-1}{8}\right)^2-\left(\frac{x+1}{6}\right)^2=1$ (k, h)

center $(-1,1)$
opens vert.
$a=8$
$b=6$
$c^2=a^2+b^2$
$c=\sqrt{100}$
$c=10$

Focus Points: $(-1,1\pm10)$ $(-1,11)$ $(-1,-9)$

Slopes of Asymptotes: $\pm\frac{8}{6}=\pm\frac{4}{3}$



13. $y^2-x^2+8y+16x-148=0$

$y^2+8y-x^2+16x=148$

$y^2+8y+16-(x^2-16x+64)=148+16-64$

$\frac{(y+4)^2}{100}-\frac{(x-8)^2}{100}=\frac{100}{100}$

$\frac{(y+4)^2}{100}-\frac{(x-8)^2}{100}=1$

center $(8,-4)$
opens vert.
$a=10$
$b=10$
$c=10\sqrt{2}$

Focus Points: $(8,-4\pm10\sqrt{2})$

Slopes of Asymptotes: ±1