Review WS KEY

Wednesday, April 29, 2015 1:40 PM

Precalculus
Conic Section – Hyperbolas & Parabola (Review)

Name: Key
Period:

(#1-3) For each expanded equation, write down the name of the shape and then put it into general form.

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

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

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

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

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

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

hyperbola (Shape) up/down

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

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

$(x^2 - 4x + \underline{4}) = 20y + 36 + \underline{4}$

$(x-2)^2 = 20y + 40$

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

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

Parabola (Shape) up

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

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

$-2(y^2 - 6y + \underline{9}) = x + 25 - \underline{18}$

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

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

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

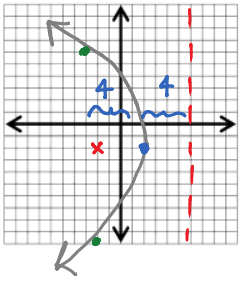
Parabola (Shape) left

(#4-7) Write an equation for each conic section described below. Use the graph to help you (if you need it!)

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

Left
vertex: (2, -2)
p = 4
FW = 16

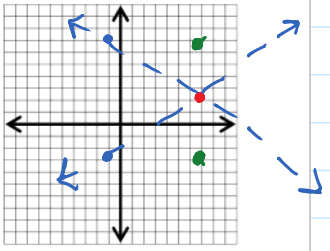
$(y+2)^2 = -16(x-2)^2$



5. A hyperbola with ~~focus points~~ transverse endpoints at (7, 7) and (7, -3) and slopes of asymptotes $\pm\frac{5}{8}$ ⇒ b = 5, a = 8

up/down ⇒ y (+)
center: (7, 2)

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



6. A hyperbola with a center of (0, -3), ~~on~~ a vertex at (3, -3) and a focus at (4, -3)

F = 4 left/right

7. A parabola with a vertex at (-1, 10) and focus point at (-1, 12) up, p = 2, FW = 8

6. A hyperbola with a center of (0, -3), ~~on~~ a vertex at (3, -3) and a focus at (4, -3)

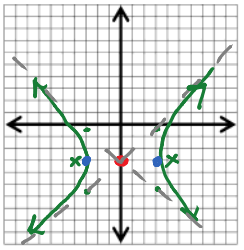
$F = 4$ left/right

$a = 3$

$4 = \sqrt{3^2 + b^2}$

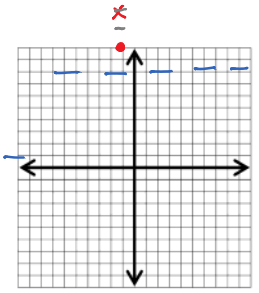
$b^2 = 7$

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



7. A parabola with a vertex at (-1, 10) and focus point at (-1, 12) up, $p = 2$, $FW = 8$

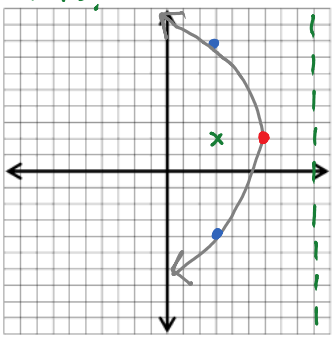
$$(x+1)^2 = 8(y-10)$$



(#8-9) Graph each parabola on the grid given. Identify the vertex, the focus and the equations of the directrix and axis of symmetry.

8. $(y-2)^2 = -12(x-6)$ $FW = 12 \Rightarrow p = 3$

left!



Vertex: (6,2)

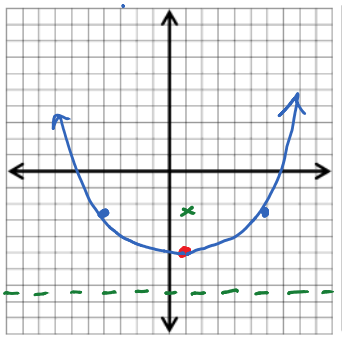
Focus: (3,2)

Directrix: $x = 9$

A of S: $y = 2$

9. $10(y+5) = (x-1)^2$ $FW = 10 \Rightarrow p = \frac{10}{4} = \frac{5}{2} = 2.5$

UP!



Vertex: (1,-5)

Focus: $(1, -\frac{5}{2})$

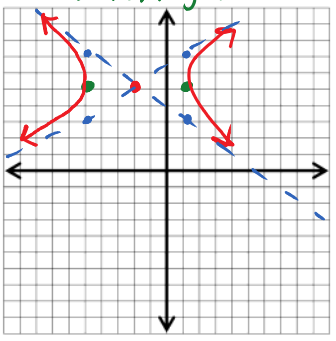
Directrix: $y = -\frac{15}{2}$

A of S: $x = 1$

(#10-11) Graph each hyperbola given and state the focus points and the slopes of the asymptotes.

10. $\left(\frac{x+2}{3}\right)^2 - \left(\frac{y-5}{2}\right)^2 = 1 \Rightarrow \frac{(x+2)^2}{9} - \frac{(y-5)^2}{4} = 1$

Left/Right



Center: (-2,5)

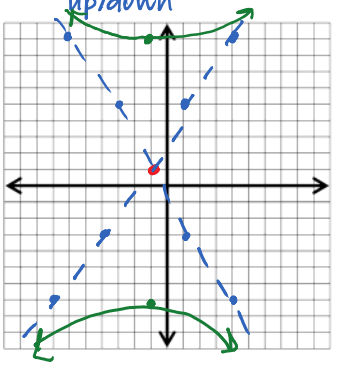
Foci: $(-2+\sqrt{13}, 5)$

$(-2-\sqrt{13}, 5)$

Slope of Asymptotes: $\pm 2/3$

11. $\left(\frac{y-1}{8}\right)^2 - \left(\frac{x+1}{6}\right)^2 = 1 \Rightarrow \frac{(y-1)^2}{64} - \frac{(x+1)^2}{36} = 1$

up/down



Center: (-1,1)

Foci: (-1, 11)

(-1, -9)

Slope of Asymptotes: $\pm \frac{4}{3}$