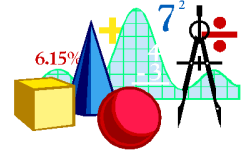


EXAMPLE #6

period 1 warm up

Given: $y = 3x^2 - 6x + 5$

X	Y ₁
-2	29
-1	14
0	5
1	2
2	5
3	14
4	29



a. Find the vertex.

$(1, 2)$

b. Write the equation in vertex form.

$y = 3(x - 1)^2 + 2$
 $y = \frac{1}{4p}(x - h)^2 + k$

c. Find the focus and directrix.

$(1, \frac{25}{12})$

$y = \frac{23}{12}$

$\frac{4p}{4p} = 3 \cdot 4p$
 $1 = 12p$
 $\frac{1}{12} = p$

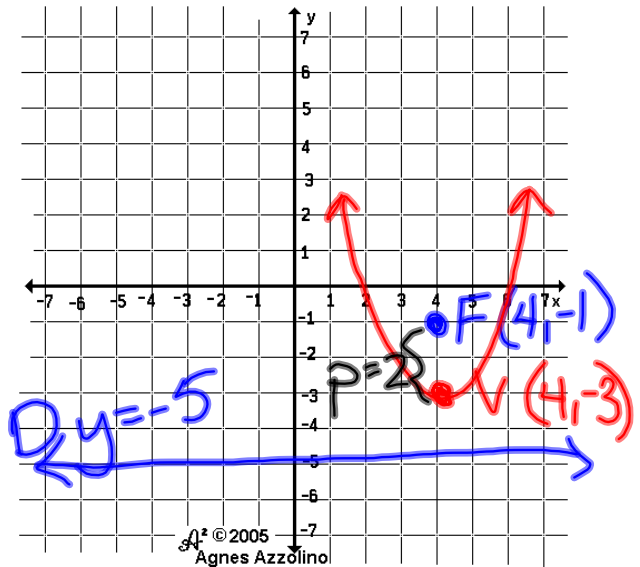


Determine an equation for the parabola with focus $(4, -1)$ and directrix $y = -5$.
(Use of the grid below is optional.)

$$y = \frac{1}{4p}(x-h)^2 + k$$

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

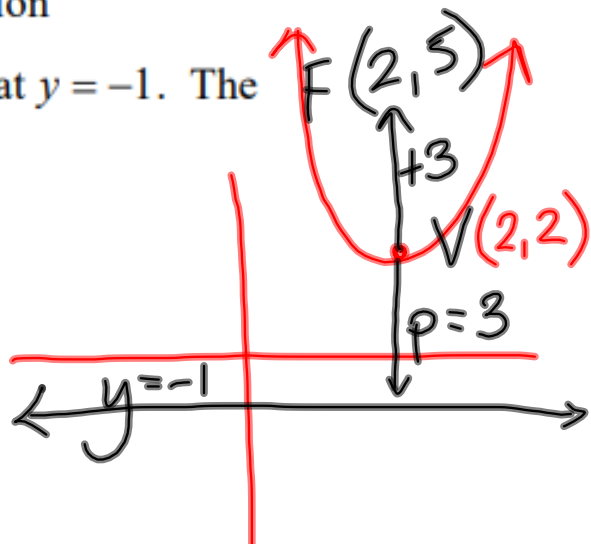
$$\boxed{y = \frac{1}{8}(x-4)^2 - 3}$$



The parabola described by the equation

$y = \frac{1}{12}(x-2)^2 + 2$ has the directrix at $y = -1$. The focus of the parabola is $(2, 2)$.

- 1) $(2, -1)$
- 2) $(2, 2)$
- 3) $(2, 3)$
- 4) $(2, 5)$



Which equation represents a parabola with a focus of $(0,4)$ and a directrix of $y = 2$?

- 1) $y = x^2 + 3$
- ~~2) $y = -x^2 + 1$~~
- 3) $y = \frac{x^2}{2} + 3$
- 4) $y = \frac{x^2}{4} + 3$

$y = \frac{1}{4p}(x-h)^2 + k$

$y = \frac{1}{4(1)}(x-0)^2 + 3$

$\frac{1}{4}x^2 + 3$

A parabola has its focus at $(1,2)$ and its directrix is $y = -2$. The equation of this parabola could be

- ~~1) $y = 8(x+1)^2$~~
- 2) $y = \frac{1}{8}(x+1)^2$
- ~~3) $y = 8(x-1)^2$~~
- 4) $y = \frac{1}{8}(x-1)^2 + 0$

$y = \frac{1}{4p}(x-h)^2 + k$

$\frac{1}{2}$ (distance) F to D

$\frac{1}{2}(4) = 2$

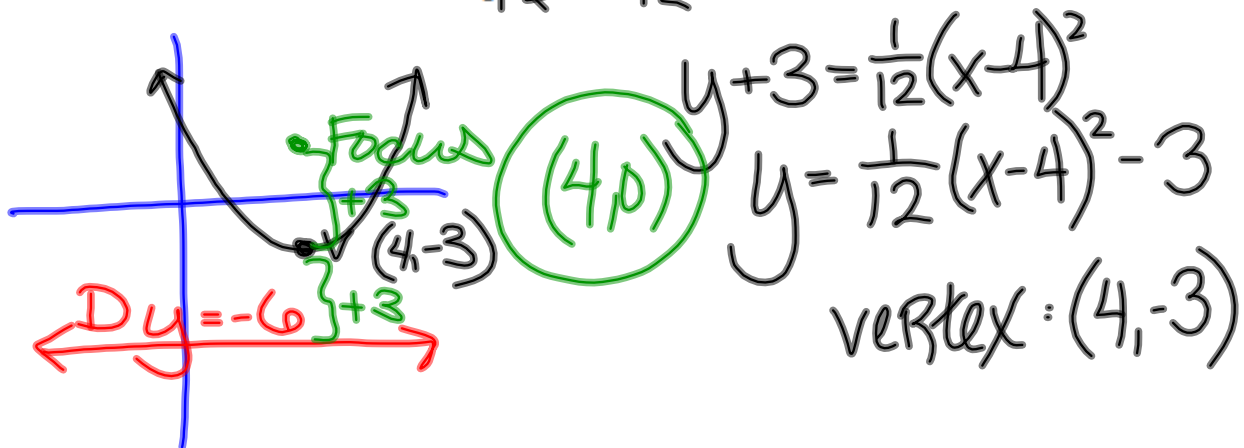
Same as x-value focus

midpoint of F + D y-values

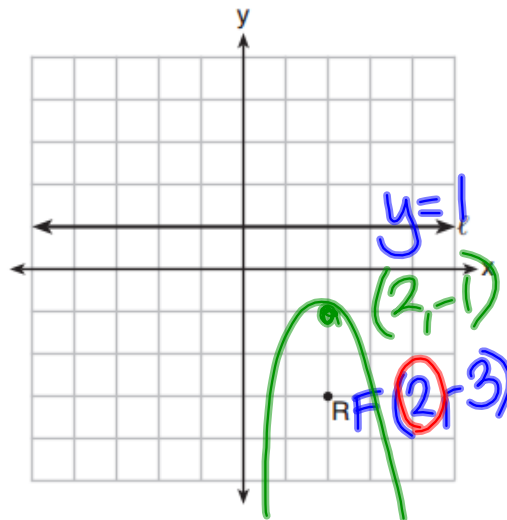
$\frac{1}{4(2)}$

Regents Practice!!!

The directrix of the parabola $\frac{1}{12}(y+3) = (x-4)^2$ has the equation $y = -6$. Find the coordinates of the focus of the parabola.



Which equation represents the set of points equidistant from line l and point R shown on the graph below?



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

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

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

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

Homework

Kuta Software - Infinite Algebra 2

Name _____

Writing Equations of Parabolas

Date _____ Period _____

Use the information provided to write the vertex form equation of each parabola.

1) Vertex at origin, Focus: $(0, -\frac{1}{32})$
 $(0,0)$

3) Vertex at origin, Directrix: $y = \frac{1}{4}$
 $(0,0)$

5) Vertex: $(-5, 8)$, Focus: $(-\frac{21}{4}, 8)$

7) Vertex: $(-6, -9)$, Directrix: $y = -\frac{47}{8}$

~~9) Vertex: $(8, -1)$, y-intercept: -17~~

1) Vertex at origin, Focus: $\left(0, -\frac{1}{32}\right)$

$$y = -8x^2$$

3) Vertex at origin, Directrix: $y = \frac{1}{4}$

$$y = -x^2$$

5) Vertex: $(-5, 8)$, Focus: $\left(-\frac{21}{4}, 8\right)$

$$x = -(y - 8)^2 - 5$$

7) Vertex: $(-6, -9)$, Directrix: $x = -\frac{47}{8}$

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

9) Vertex: $(8, -1)$, y-intercept: -17

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