

## CCGPS Analytic Geometry Parabolas Practice

Equations for Parabolas:  $(x - h)^2 = 4p(y - k)$        $(y - k)^2 = 4p(x - h)$

Graph the parabola and then find all of the given information.

1.  $(y - 3)^2 = -4(x + 2)$

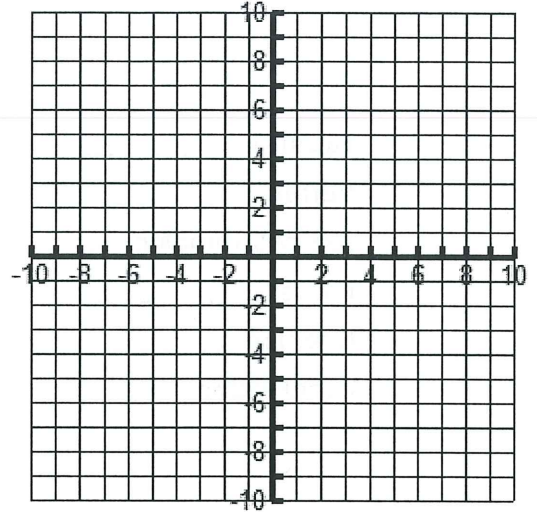
Vertex: \_\_\_\_\_  $p =$  \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

Focus: \_\_\_\_\_

Directrix: \_\_\_\_\_

Focal width: \_\_\_\_\_



2.  $x^2 - 2x - 4y + 5 = 0$

Equation: \_\_\_\_\_  $p =$  \_\_\_\_\_

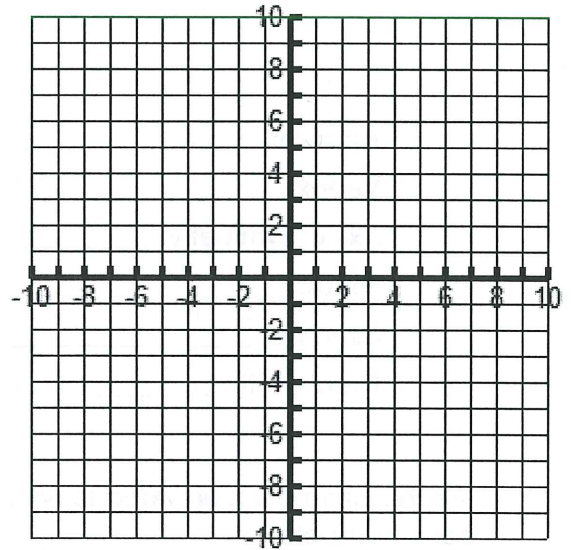
Vertex: \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

Focus: \_\_\_\_\_

Directrix: \_\_\_\_\_

Focal width: \_\_\_\_\_



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

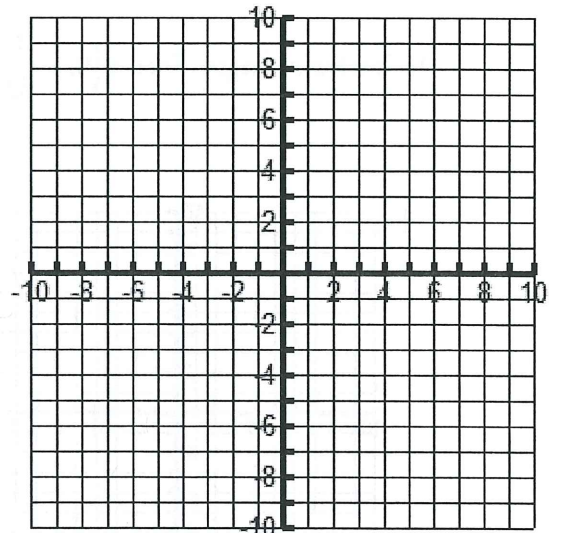
Vertex: \_\_\_\_\_  $p =$  \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

Focus: \_\_\_\_\_

Directrix: \_\_\_\_\_

Focal width: \_\_\_\_\_

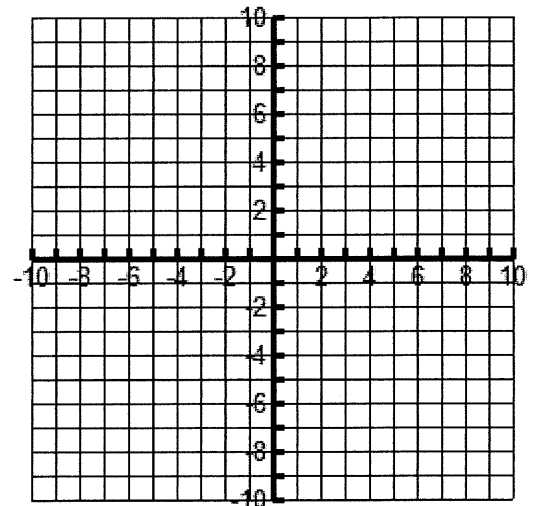


Equations for Parabolas:  $(x - h)^2 = 4p(y - k)$

$(y - k)^2 = 4p(x - h)$

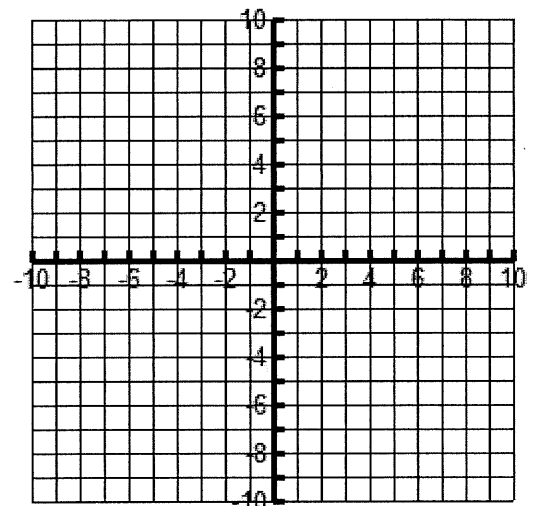
4.  $y^2 - 4y - 8x = 12$

Equation: \_\_\_\_\_  
 Vertex: \_\_\_\_\_  $p =$  \_\_\_\_\_  
 Axis of Symmetry: \_\_\_\_\_  
 Focus: \_\_\_\_\_  
 Directrix: \_\_\_\_\_  
 Focal width: \_\_\_\_\_



5.  $y^2 - 2y + 8x = -25$

Equation: \_\_\_\_\_  
 Vertex: \_\_\_\_\_  $p =$  \_\_\_\_\_  
 Axis of Symmetry: \_\_\_\_\_  
 Focus: \_\_\_\_\_  
 Directrix: \_\_\_\_\_  
 Focal width: \_\_\_\_\_



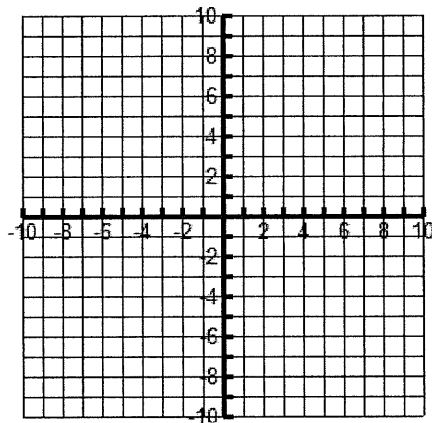
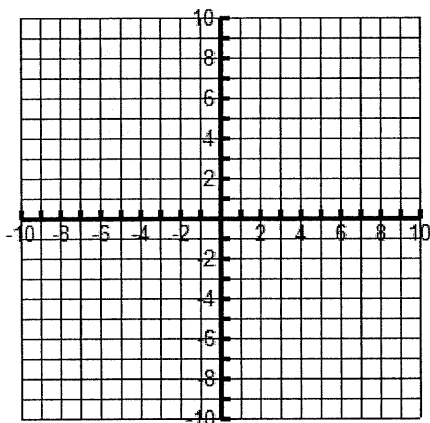
Use the information provided to write the standard form for each parabola.

Equations for Parabolas:  $(x - h)^2 = 4p(y - k)$

$(y - k)^2 = 4p(x - h)$

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

2) Vertex at origin, Focus:  $(0, \frac{1}{8})$

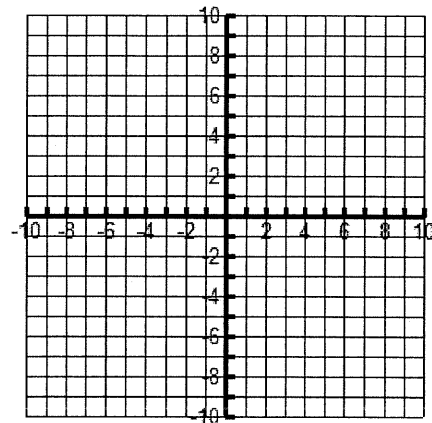
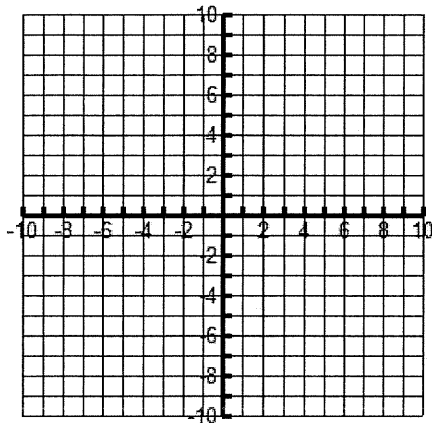


Use the information provided to write the standard form for each parabola.

Equations for Parabolas: up/down parabolas:  $(x - h)^2 = 4p(y - k)$  right/left parabolas:  $(y - k)^2 = 4p(x - h)$

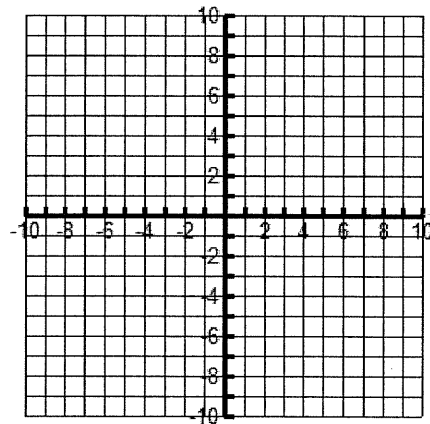
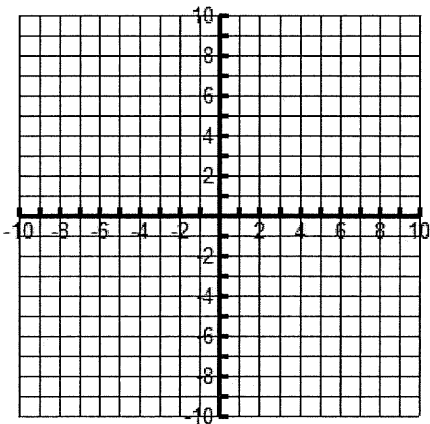
3) Directrix:  $x = -7$  Focus:  $(-3, 4)$

4) Directrix:  $x = 8$  focus:  $(4, -1)$



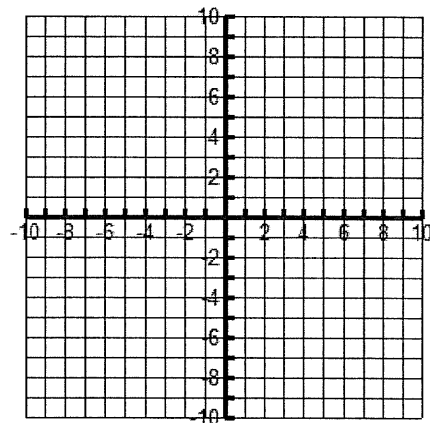
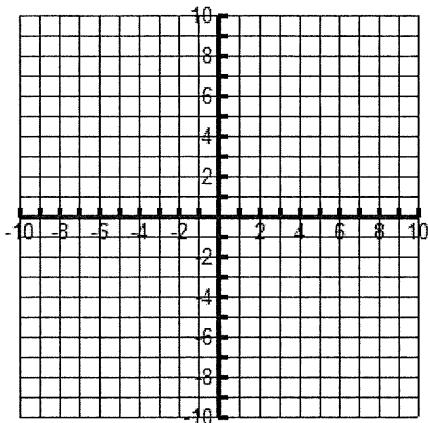
5) Vertex:  $(-5, 8)$  Focus:  $(-3, 8)$

6) Directrix:  $y = 4$  focus:  $(3, -2)$



7) Vertex:  $(-6, -9)$  Directrix:  $x = -4$

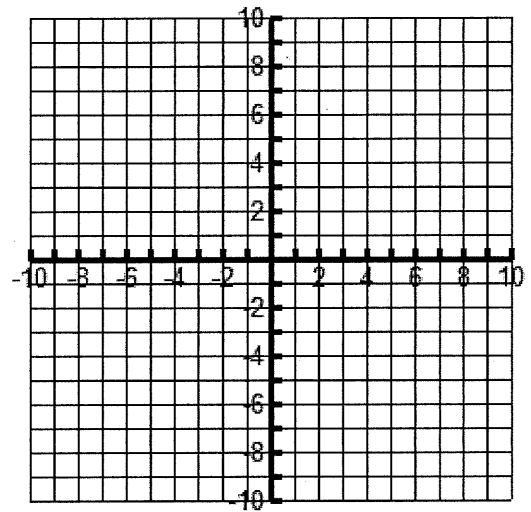
8) Vertex:  $(8, 9)$  Directrix:  $y = 10$



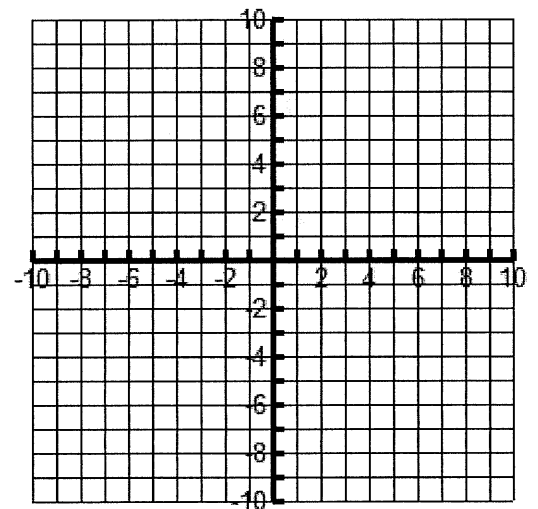
Equations for Parabolas:  $(x - h)^2 = 4p(y - k)$        $(y - k)^2 = 4p(x - h)$

Use the information provided to write the standard form for each parabola.

9. Opens left or right with a vertex at  $(7, 6)$  and passes through  $(5, 2)$



10. Opens up or down with a vertex at  $(7, 0)$  and passes through  $(6, -1)$



# CCGPS Analytic Geometry Parabolas Practice

Key

Equations for Parabolas: up/down parabolas:  $(x - h)^2 = 4p(y - k)$

right/left parabolas:  $(y - k)^2 = 4p(x - h)$

Graph the parabola and then find all of the given information.

1.  $(y - 3)^2 = -4(x + 2)$

opens left



Vertex:  $(-2, 3)$

$4p = -4$

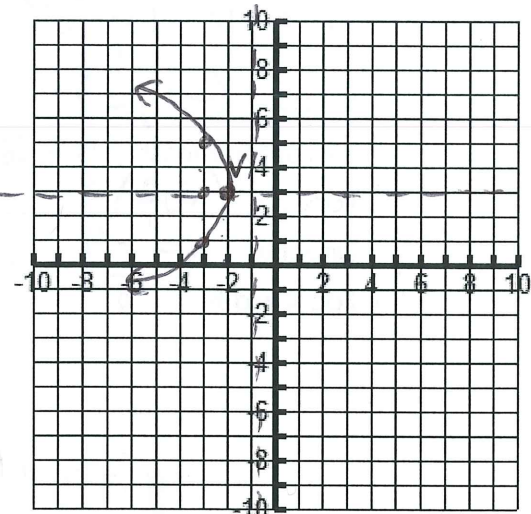
Axis of Symmetry:  $y = 3$

$p = -1$

Focus:  $(-2, 3)$

Directrix:  $x = -1$

Focal width: 4



2.  $x^2 - 2x - 4y + 5 = 0$   $(\frac{1}{2})^2 = (\frac{2}{2})^2 = 1$

opens up

$x^2 - 2x + 1 = 4y - 5 + 1$

$(x - 1)^2 = 4y - 4$

$(x - 1)^2 = 4(y - 1)$



Equation: \_\_\_\_\_

$4p = 4$

Vertex:  $(1, 1)$

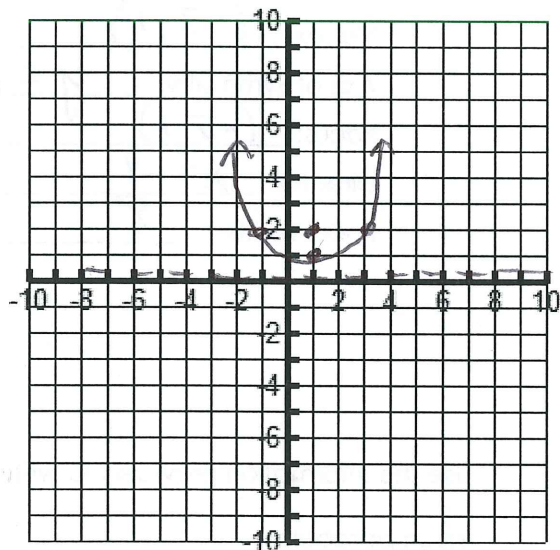
$p = +1$

Axis of Symmetry:  $x = 1$

Focus:  $(1, 2)$

Directrix:  $y = 0$

Focal width: 4



3.  $x^2 = -8(y + 1)$   $(x - 0)^2 = -8(y + 1)$

opens



$4p = -8$

Vertex:  $(0, -1)$

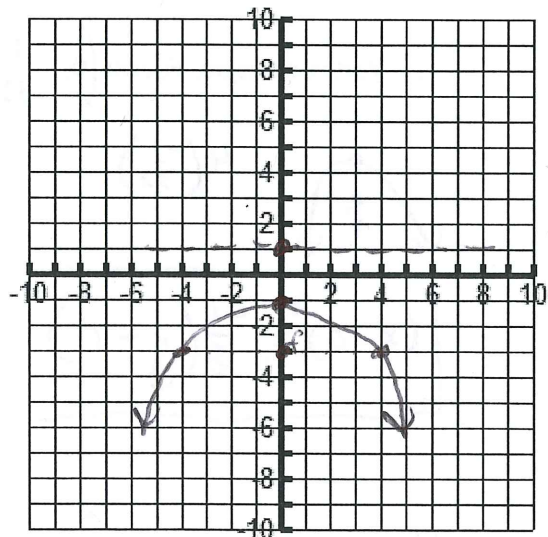
$p = -2$

Axis of Symmetry:  $x = 0$

Focus:  $(0, -3)$

Directrix:  $y = 1$

Focal width: 8



Equations for Parabolas: up/down parabolas:  $(x-h)^2 = 4p(y-k)$

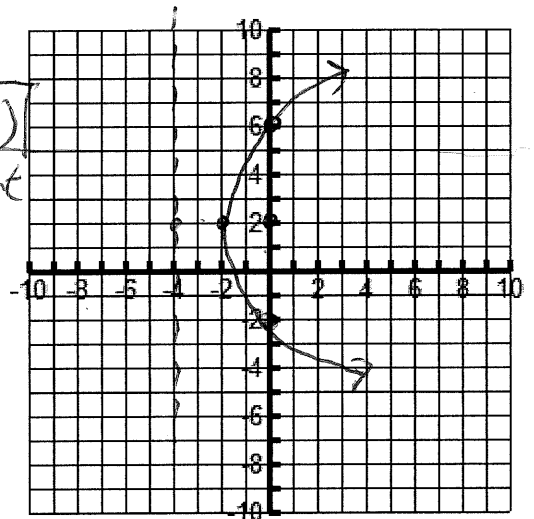
right/left parabolas:  $(y-k)^2 = 4p(x-h)$

4.  $y^2 - 4y - 8x = 12$

$$y^2 - 4y + \underline{4} = 8x + 12 + \underline{4}$$

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

Vertex:  $(-2, 2)$   $(y-2)^2 = 8(x+2)$   
 Axis of Symmetry:  $y = 2$  opens right  
 Focus:  $(0, 2)$   
 Directrix:  $x = -4$   
 Focal width:  $8$   $4p = 8$   
 $p = 2$

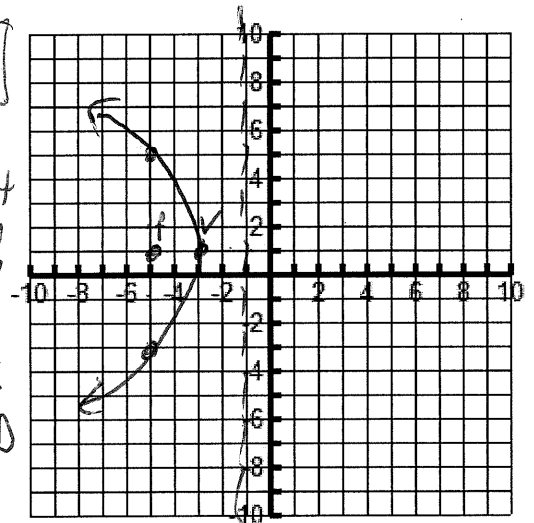


5.  $y^2 - 2y + 8x = -25$

$$y^2 - 2y + \underline{1} = -8x - 25 + \underline{1}$$

$$(y-1)^2 = -8x - 24$$

Vertex:  $(-3, 1)$   $(y-1)^2 = -8(x+3)$   
 Axis of Symmetry:  $y = 1$   $p = -2$   
 Focus:  $(-5, 1)$  opens left  
 Directrix:  $x = -1$   
 Focal width:  $8$   $4p = -8$



Use the information provided to write the standard form for each parabola.

Equations for Parabolas: up/down parabolas:  $(x-h)^2 = 4p(y-k)$

right/left parabolas:  $(y-k)^2 = 4p(x-h)$

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

$4\left(-\frac{1}{32}\right)$

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

2) Vertex at origin, Focus:  $(0, \frac{1}{8})$   $p = \frac{1}{8}$

$4\left(\frac{1}{8}\right)$

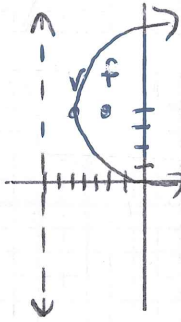
$$(x-0)^2 = \frac{1}{2}(y-0)$$



Equations for Parabolas: up/down parabolas:  $(x-h)^2 = 4p(y-k)$

right/left parabolas:  $(y-k)^2 = 4p(x-h)$

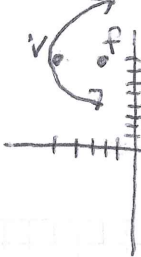
3) Directrix:  $x = -7$   
Focus:  $(-3, 4)$



$$(y-4)^2 = 8(x+5)$$

opens right  
 $(y-k)^2 = 4p(x-h)$   
vertex:  $(-5, 4)$   
 $p = 2$

5) Vertex:  $(-5, 8)$ , Focus:  $(-3, 8)$

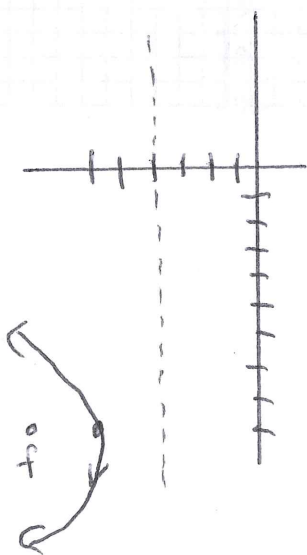


$p = 2$  opens right

$$(y-k)^2 = 4p(x-h)$$

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

7) Vertex:  $(-6, -9)$ , Directrix:  $x = -4$   
opens left  $p = -2$

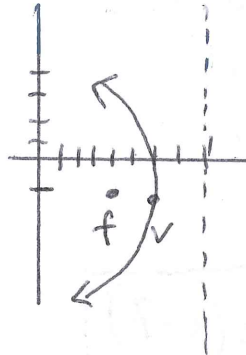


$$(y-k)^2 = 4p(x-h)$$

$$(y+9)^2 = -8(x+6)$$

4) Directrix:  $x = 8$

focus:  $(4, -1)$



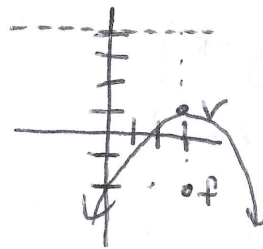
h k  
vertex:  $(6, -1)$

$p = -2$

$$(y-k)^2 = 4p(x-h)$$

$$(y+1)^2 = -8(x-6)$$

6) Directrix:  $y = 4$   
focus:  $(3, -2)$



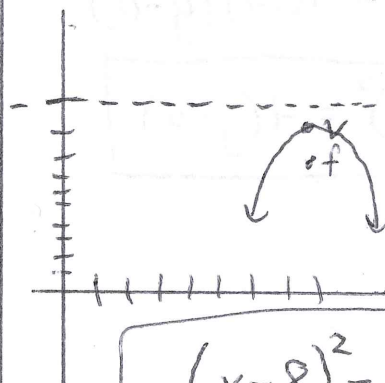
vertex:  $(3, 1)$

$p = -3$

$$(x-h)^2 = 4p(y-k)$$

$$(x-3)^2 = -12(y-1)$$

8) Vertex:  $(8, 9)$ , Directrix:  $y = 10$   
opens down  
 $p = -1$



$$(x-h)^2 = 4p(y-k)$$

$$(x-8)^2 = -4(y-9)$$

Equations for Parabolas: up/down parabolas:  $(x-h)^2 = 4p(y-k)$

right/left parabolas:  $(y-k)^2 = 4p(x-h)$

9. Opens left or right with a vertex at  $(7, 6)$  and passes through  $(5, 2)$

$$(y-k)^2 = 4p(x-h)$$

find p-value

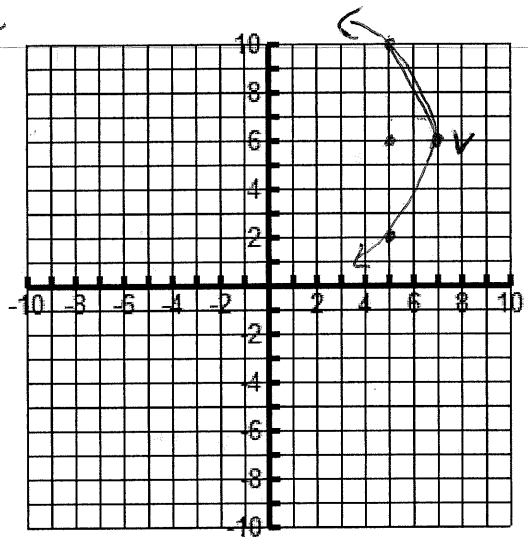
$$(2-6)^2 = 4p(5-7)$$

$$4^2 = 4p(-2)$$

$$16 = -8p$$

$$\boxed{-2 = p}$$

$$\boxed{(y-6)^2 = -8(x-7)}$$



10. Opens up/down with a vertex at  $(7, 0)$  and passes through  $(6, -1)$

$$(x-h)^2 = 4p(y-k)$$

$$(6-7)^2 = 4p(-1-0)$$

$$1 = 4p(-1)$$

$$\frac{-1}{4} = p$$

$$(x-7)^2 = 4\left(\frac{-1}{4}\right)(y-0)$$

$$\boxed{(x-7)^2 = -1(y-0)}$$

