

Writing Equations of Parabolas Notes

Parabolas – Writing Equations

Example 5:

Write the equation of the parabola in standard form. Identify the length of the latus rectum and p .

$$x^2 - 2x = 2y - 7$$

$$x^2 - 2x + 1 = 2y - 7 + 1$$

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

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

$$LR = 2$$

$$4p = 2$$

$$p = \frac{2}{4}$$

$$p = \frac{1}{2}$$

Example 6:

Write the equation of the parabola in standard form. Identify the length of the latus rectum and p .

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

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

$$\left(\frac{y}{2}\right)^2 = \left(\frac{y}{2}\right)^2 = 4$$

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

$$LR = 4$$

$$4p = 4$$

$$p = 1$$

Writing Equations of Parabolas Notes

Example 7:

Write the standard form equation of each parabola described below.

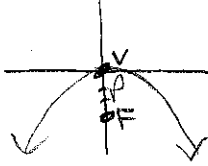
a. vertex: $(0, 0)$

focus: $(0, -3)$

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

(0) (-3)

$$x^2 = -12y$$



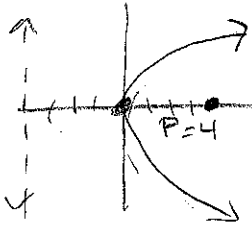
b. vertex: $(0, 0)$

directrix: $x = -4$

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

(0) (4) (0)

$$y^2 = 16x$$



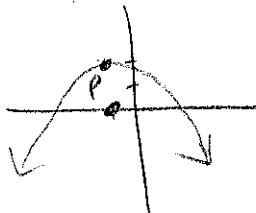
c. vertex: $(-1, 2)$

focus: $(-1, 0)$

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

(-1) (-2) (2)

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



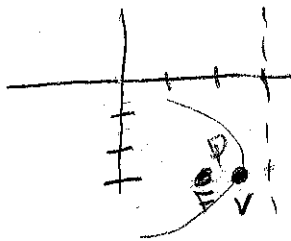
d. focus: $(2, -3)$

directrix: $x = 3$

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

(-3) $(-\frac{1}{2})$ (2.5)

$$(y+3)^2 = -2(x-2.5)$$



Vertex
 $(2.5, -3)$

$p = \frac{1}{2}$