

Parabolas Writing Equations Notes

Parabolas – Writing Equations

Example 5:

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

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

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

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

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

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

V(1,3) up
length of LR = 2
p = $\frac{1}{2}$

$$4p = 2$$
$$p = \frac{1}{2}$$

← 1) rearrange/group

← 2) complete the square

← 3) factor/combine

← 4) factor right

Example 6:

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

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

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

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

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

V: (-1, 2) right

$$LR = 4$$

$$p = 1 \leftarrow 4p = 4$$

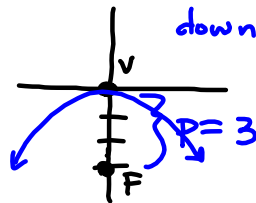
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Example 7:

Write the standard form equation of each parabola described below.

a. vertex: $(0, 0)$

focus: $(0, -3)$

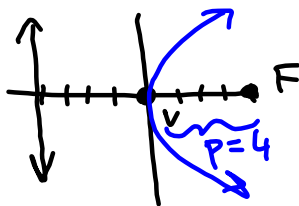


$$x^2 = -12y$$

$$4p = 12$$

b. vertex: $(0, 0)$

directrix: $x = -4$

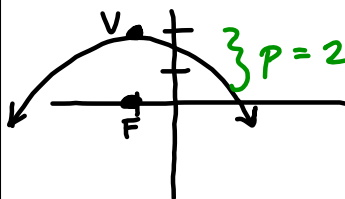


$$y^2 = 16x$$

$$4p = 16$$

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

focus: $(-1, 0)$

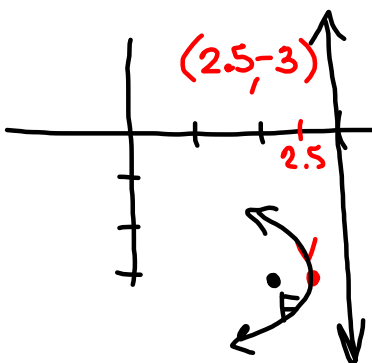


$$(x+1)^2 = -8(y-2)$$

$$4p = 8$$

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

directrix: $x = 3$



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

$$4p = 2$$