HAT
Parabolas

1/30/18

Warm Up: $y = -x^2 - 2x + 3$

Write the equation in vertex form, identify the vertex, axis of symmetry and the direction the parabola opens.

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

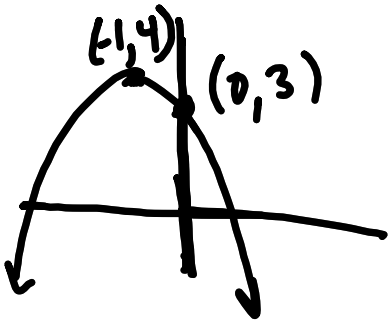
$(x+1)(x+1)$

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

Vertex: $(-1, 4)$

AOS: $x = -1$

opens down



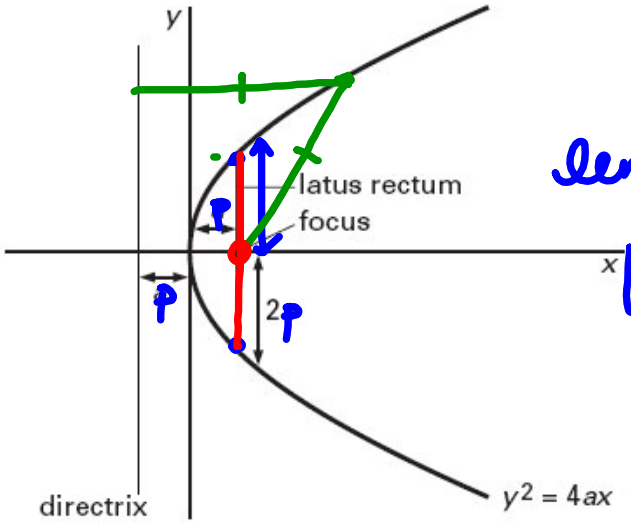
A parabola is the set of all points (x, y) in a plane that are the same distance from a given point called the focus as from a given line called the directrix.

The standard form for a parabola is

$$(x-h)^2 = 4p(y-k) \quad \text{opens up/down}$$

$$(y-k)^2 = 4p(x-h) \quad \text{opens left/right}$$

The line segment through the focus of a parabola and perpendicular to the axis of symmetry is called the **latus rectum**. The endpoints of the latus rectum lie on the parabola.



length of latus rectum: 4p

Ex #1: $(x-3)^2 = 4(y+1)$

$4p$

Find the equation/coordinates for the vertex, focus, directrix, axis of symmetry and latus rectum. Sketch.

Vertex: (3, -1)

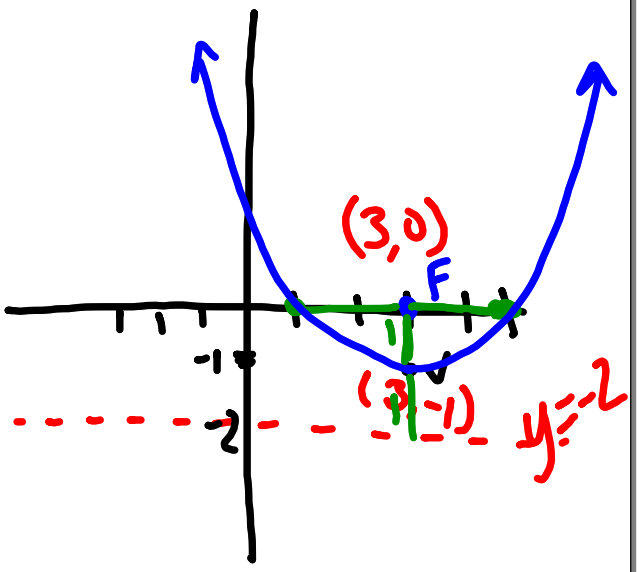
$p = 1$

length of LR: 4

opens up

Directrix: $y = -2$

Focus: (3, 0)



Assignment:

page 603 #16, 19, 24, 25, 27, 29, 31, 38, 39

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