Apr. 5, 2017

Sect. 7-1

Circles

St. Form

Find Eqn

Parabolas

St. Form

Horiz/Vert.

Vertex Directrix

Focus Latus Rectum

Circles

St. Form

$$(x-h)^2 + (y-k)^2 = r^2$$

center: (h, k)

radius $= r$

$$y-(-2)$$

$$(x-3)^2+(y+2)^2=25$$

$$C:(3,-2)$$

$$r=5$$

$$(x+1)^2 + y^2 = 13$$

$$C: (-1, 0)$$

$$r = \sqrt{13}$$

Find the eqn. of the circle with diameter endpoints $(-4, 3)$ $(4, -3)$

Need: Center
Radius

C: $MP\left(\frac{-4+4}{2}, \frac{3+(-3)}{2}\right) = (0,0)$

Radius: $d = \sqrt{(-4-4)^2 + (3-(-3))^2}$

$= \sqrt{100} = 10$

$r = \frac{d}{2} = 5$

$C: (0,0) \quad r = 5$

So $(x-0)^2 + (y-0)^2 = 5^2$

$x^2 + y^2 = 25$

Find the eqn in st. form

$$x^2+y^2-4x+8y-5=0$$

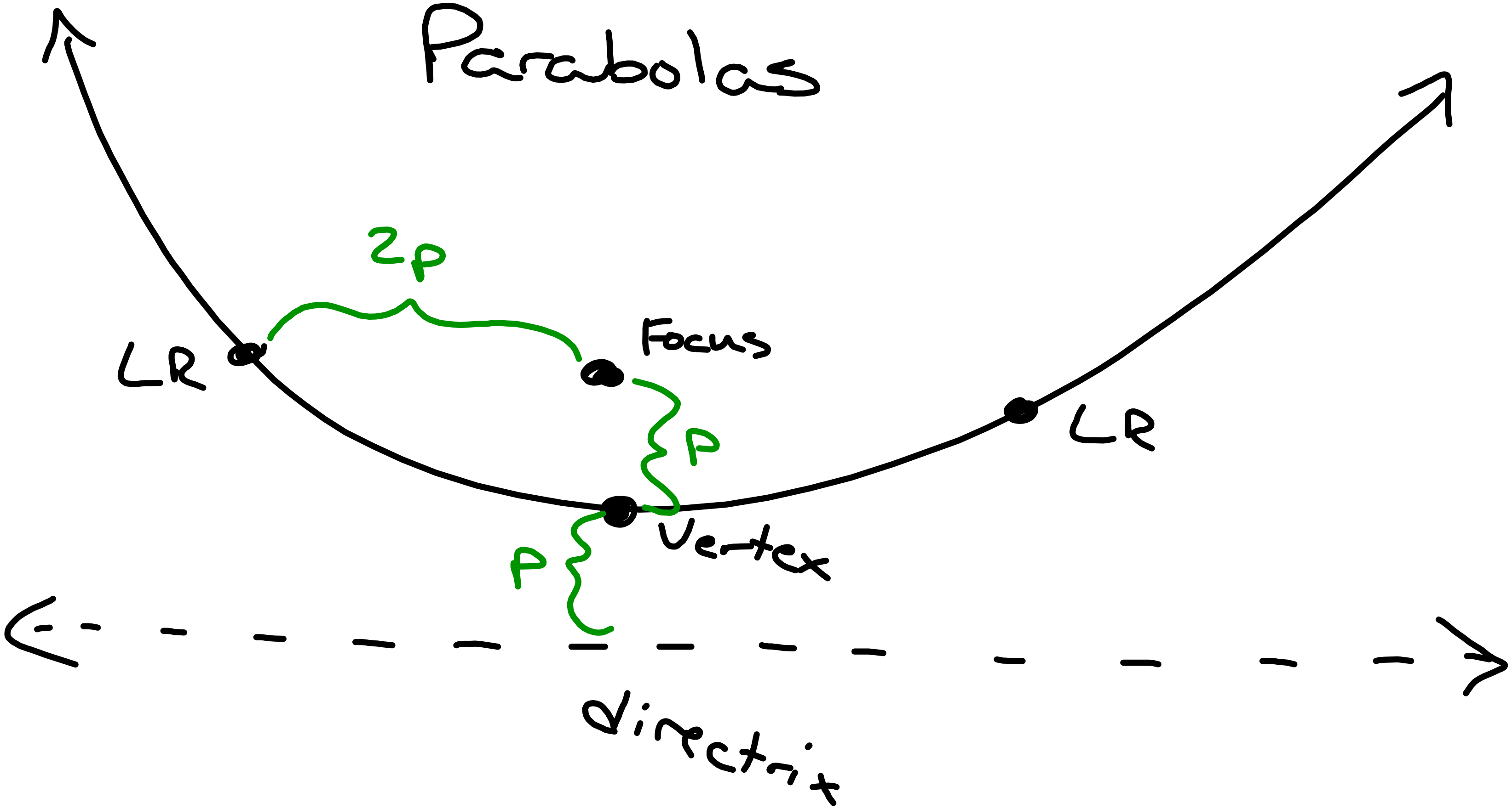
$$(x^2-4x)+(y^2+8y)=5$$

$$(x^2-4x+(2)^2)+(y^2+8y+(4)^2)=5+4+16$$

$$(x-2)^2+(y+4)^2=25$$

C: $(2,-4)$ $r=5$

Parabolas



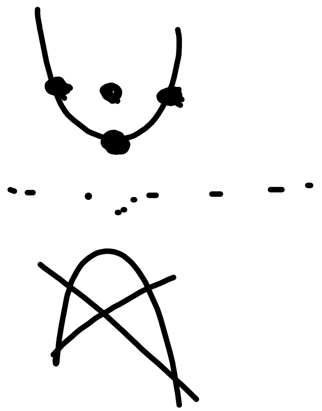
St. Form

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

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

$$y = \frac{1}{12}(x-1)^2 - 2$$

Vert.



V: $(1, -2)$

p: $\frac{1}{4p} \times \frac{1}{12}$

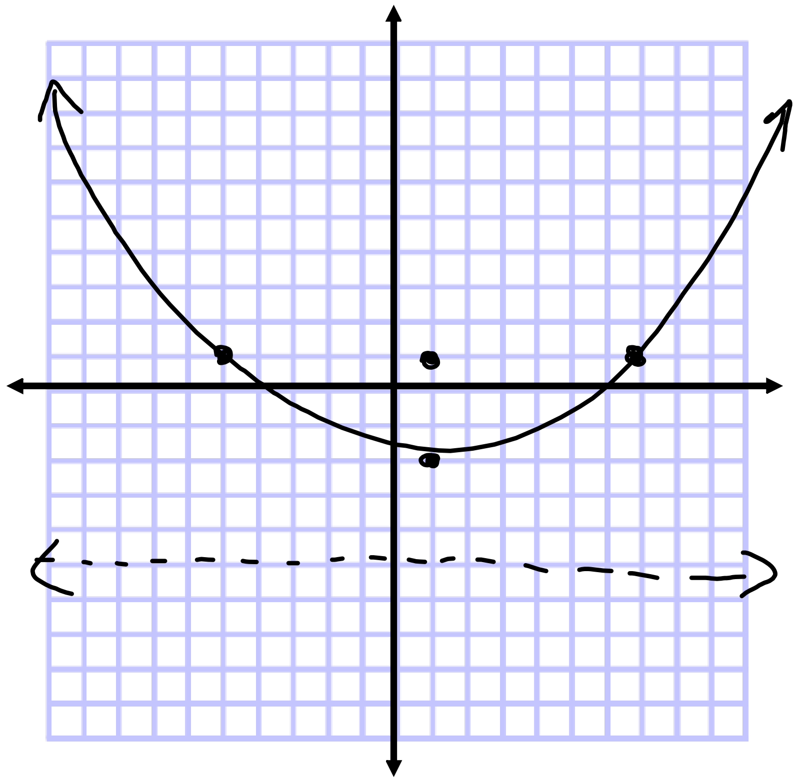
$4p = 12$

$p = 3$

F: $(1, -2+3) = (1, 1)$

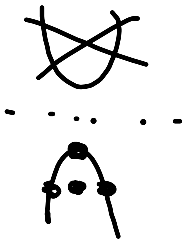
dirx: $y = -2-3 \Rightarrow y = -5$

LR: $(1 \pm 6, 1)$



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

Vert. $V: (-2, 5)$



$p: \frac{1}{4p} \times \frac{-2}{1}$

$-8p = 1$

$p = -\frac{1}{8}$

$F: \left(-2, 5 - \frac{1}{8}\right) = \left(-2, 4\frac{7}{8}\right)$

dirx: $y = 5 + \frac{1}{8} \Rightarrow y = 5\frac{1}{8}$

LR: $\left(-2 \pm \frac{1}{4}, 4\frac{7}{8}\right)$

$$4x - y^2 = 2y + 13$$

$$4x = y^2 + 2y + 13$$

$$4x = (y^2 + 2y) + 13$$

$$4x + 1 = (y^2 + 2y + (1)^2) + 13$$

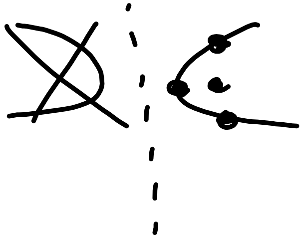
$$4x = 1(y + 1)^2 + 12$$

$$x = \frac{1}{4}(y+1)^2 + \frac{12}{4}$$

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

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

Horiz:



V: $(3, -1)$

p: $\frac{1}{4p} \cancel{\times} \frac{1}{4}$

$p = 1$

F: $(3+1, -1) = (4, -1)$

dirx: $x = 3 - 1 \Rightarrow x = 2$

LR: $(4, -1 \pm 2)$