Spiral Review:

Complete the square.

1.) $y^2 + 6y + 8x + 25 = 0$

$-8x \quad -25 \quad -8x-25$

$y^2+6y+9 = -8x-25+9$

$(y+3)^2 = -8x-16$

$\boxed{(y+3)^2 = -8(x+2)}$

2.) $x^2 - 2x + 8y + 9 = 0$

$x^2-2x+1 = -8y-9+1$

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

$\boxed{(x-1)^2 = -8(y+1)}$

HWQ 9.1 Circles

1. Find the standard form of the circle with center at (4,-2) and a radius of 3.

2. Identify the center and radius.

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

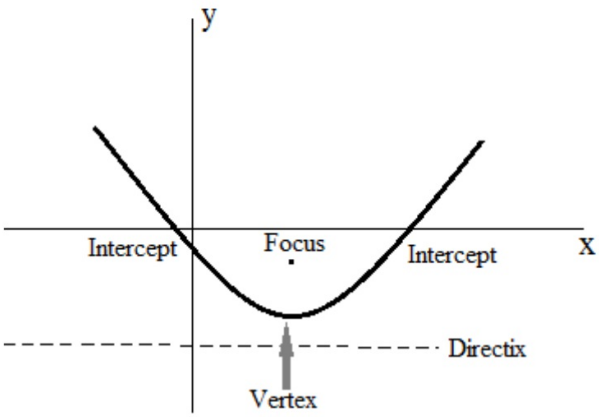
3. Identify the center and radius.

$$x^2 + 6x + y^2 - 12y + 41 = 0$$

p.636 9.1 Parabolas (Day 1)

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

*opens up or down
directrix: $y = k - p$
focus: $(h, k+p)$
vertex: (h, k)



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

*opens left or right
directrix: $x = h - p$
focus: $(h+p, k)$
vertex: (h, k)

Students will be able to find the standard form of the equation of the parabola.

Example 1: Find the standard form of the equation of the parabola with the given characteristics and vertex at the origin. (0,0) h,k

a.) Point on parabola is (-2,6) x y

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

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

$36 = 4p(-2)$

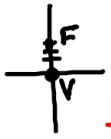
$\frac{36}{-8} = \frac{-8p}{-8}$

$p = -\frac{9}{2}$

$(y-0)^2 = 4\left(-\frac{9}{2}\right)(x-0)$

$y^2 = -18x$

b.) focus: (0,3)



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

focus $(h, k+p)$

$(0, p)$

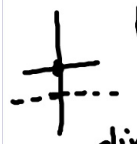
$p = 3$

$(x-0)^2 = 4(3)(y-0)$

$x^2 = 12y$

Students will be able to find the standard form of the equation of the parabola.

c.) directrix: $y = -1$



up

directrix $y = k - p$

$0 - p = -1$

$p = 1$

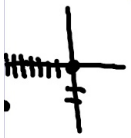
$(x-h)^2 = 4p(y-k)$

$(x-0)^2 = 4(1)(y-0)$

$x^2 = 4y$

d.) vertical axis and passes through $(-8, -2)$. (x, y)

axis of symmetry



down

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

$(-8-0)^2 = 4p(-2-0)$

$64 = 4p(-2)$

$\frac{64}{-8} = \frac{-8p}{-8}$

$p = -8$

$(x-0)^2 = 4(-8)(y-0)$

$x^2 = -32y$

Students will be able to find the vertex, focus, and directrix of the parabola and sketch its graph.

Example 2: Find the vertex, focus, and directrix of the parabola, sketch its graph.

a.) $\frac{y}{-2} = \frac{-2x^2}{-2}$

$-\frac{1}{2}y = x^2$ down

vertex: $(0,0)$

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

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

focus: $(h, k+p)$

$(0, 0-\frac{1}{8})$

$(0, -\frac{1}{8})$

directrix: $y = k - p$

$y = 0 - -\frac{1}{8}$

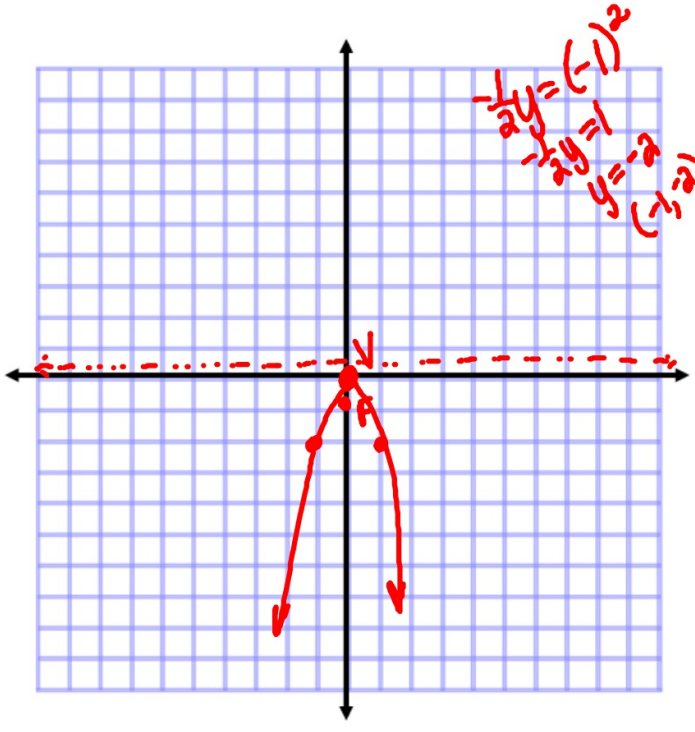
$y = \frac{1}{8}$

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

$-\frac{1}{2}y = 1$

$y = -2$

$(-1, -2)$



Students will be able to find the vertex, focus, and directrix of the parabola and sketch its graph.

b.) $x + y^2 = 0$

$y^2 = -x$ left

$4p = -1$

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

vertex: $(0,0)$

focus: $(h+p, k)$

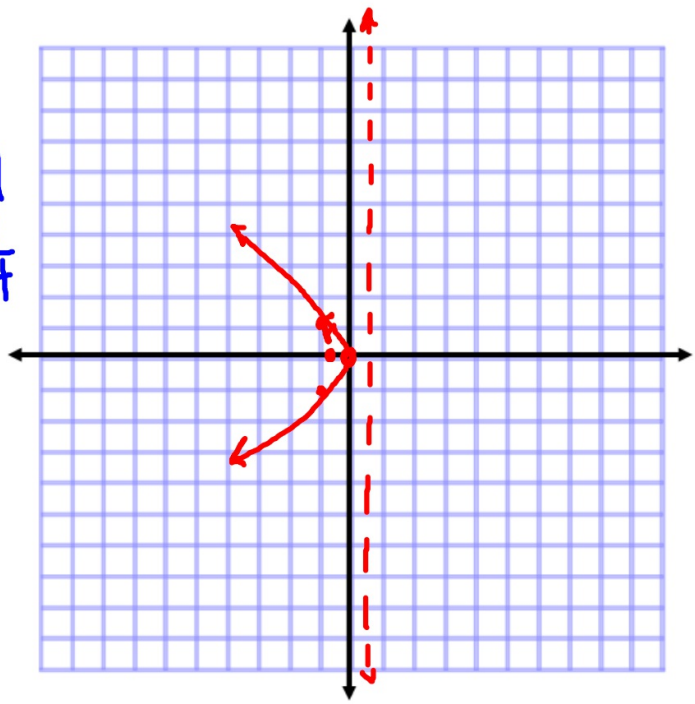
$(0-\frac{1}{4}, 0)$

$\boxed{(-\frac{1}{4}, 0)}$

directrix: $x = h - p$

$= 0 - \frac{1}{4}$

$\boxed{x = -\frac{1}{4}}$



Students will be able to find the vertex, focus, and directrix of the parabola and sketch its graph.

c.) $y^2 - 4y - 4x = 0$

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

$\boxed{(y-2)^2 = 4(x+1)}$ right

$4p = 4$

$p = 1$

vertex: $(-1, 2)$

focus: $(h+p, k)$

$(-1+1, 2)$

$\boxed{(0, 2)}$

directrix: $x = h - p$

$= -1 - 1$

$\boxed{x = -2}$

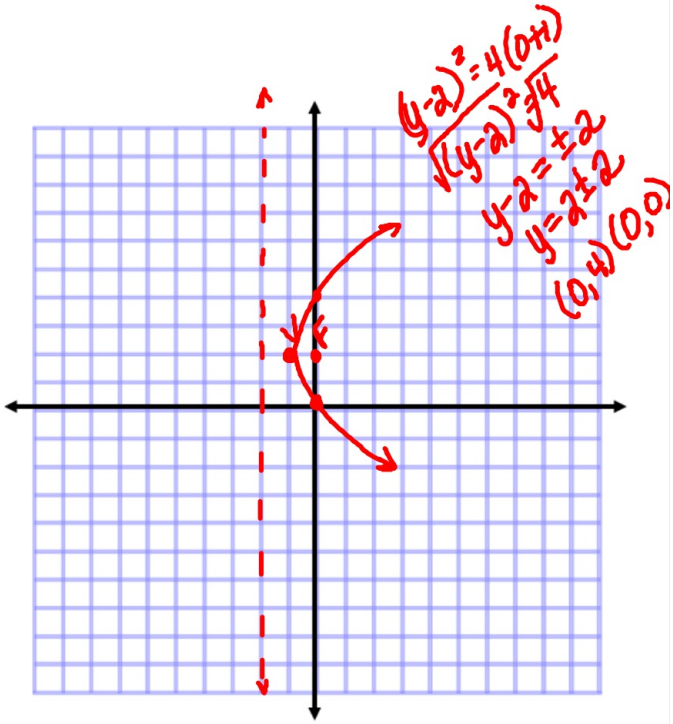
$(y-2)^2 = 4(0+1)$

$\sqrt{(y-2)^2} = \sqrt{4}$

$y - 2 = \pm 2$

$y = 2 \pm 2$

$(0, 4)\ (0, 0)$



Students will be able to find the vertex, focus, and directrix of the parabola and sketch its graph.

d.) $x^2 - 2x + 8y + 9 = 0$

$x^2 - 2x + 1 = -8y - 9 + 1$

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

vertex: $(1, -1)$

$4p = -8$

$p = -2$

focus: $(h, k+p)$

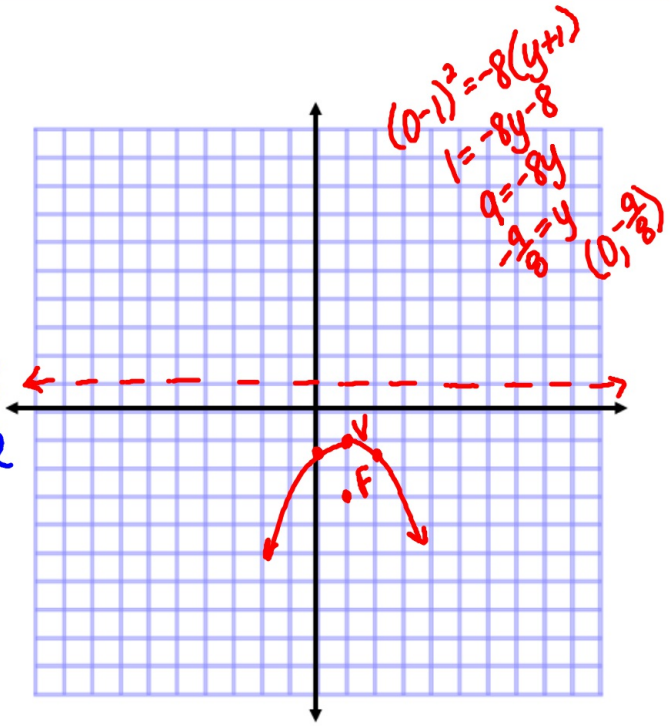
$(1, -1-2)$

$(1, -3)$

directrix: $y = k - p$

$y = -1 + 2$

$y = 1$



Turn-in:

p.644 (44, 58, 64, 70)

HW:

p.644 (43- 75 odds)