

8.06b Parabolas and Circles Review WS #2

Key

1. Identify the characteristics of the parabola. Graph and label all parts.

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

$p = -4$ $4p = -16$ $p = -4$ opens left

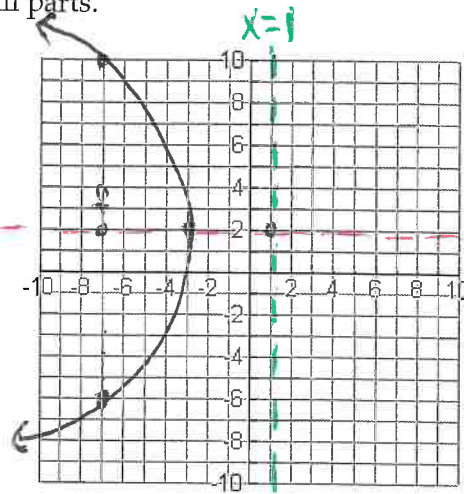
Vertex: $(-3, 2)$

Focus: $(-7, 2)$

Directrix: $x = 1$

Axis of Symmetry: $y = 2$

Focal Width: 16



AOS $y = 2$

2. Write the equation of the parabola $x^2 - 4x + 8y - 13 = 39$ in standard form. Identify the vertex, focus, directrix, axis of symmetry, and focal width. Graph the parabola and label all parts.

Standard Form: $(x - 2)^2 = -8(y - 7)$ $(\frac{b}{2})^2 = (\frac{4}{2})^2 = 4$

$4p = -8$ $p = -2$

$x^2 - 4x + 4 = -8y + 13 + 39 + 4$
 $(x - 2)(x - 2) = -8y + 56$
 $(x - 2)^2 = -8(y - 7)$

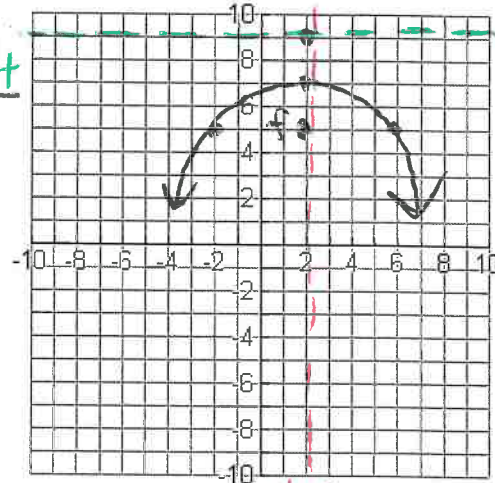
Vertex: $(2, 7)$

Focus: $(2, 5)$

Directrix: $y = 9$

Axis of Symmetry: $x = 2$

Focal Width: 8



opens down

AOS $x = 2$

3. Write the standard form of the equation for the parabola with a focus at $(2, 1)$ and directrix at $x = -2$. Identify its characteristics. Graph the parabola and label all parts.

Standard Form: $(y - 1)^2 = 8(x - 0)$
 $(y - k)^2 = 4p(x - h)$
 $(y - 1)^2 = 4(2)(x - 0)$

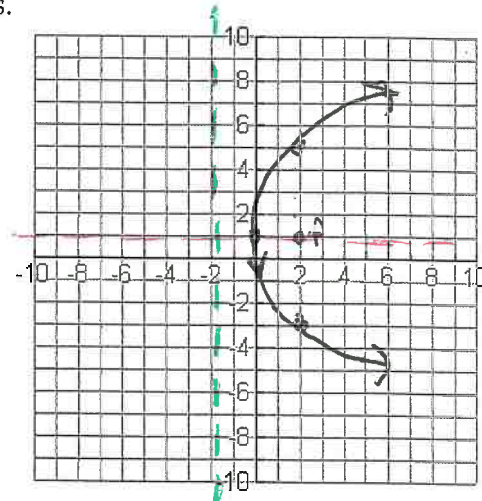
$p = 2$

Vertex: $(0, 1)$

Directrix: $x = -2$

Axis of Symmetry: $y = 1$

Focal width: 8



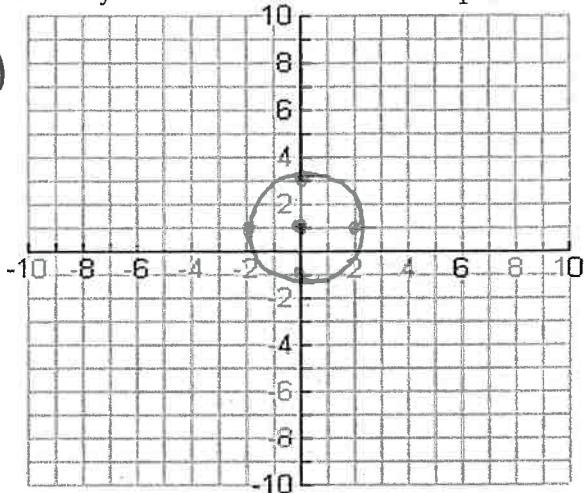
opens right

AOS $y = 1$

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

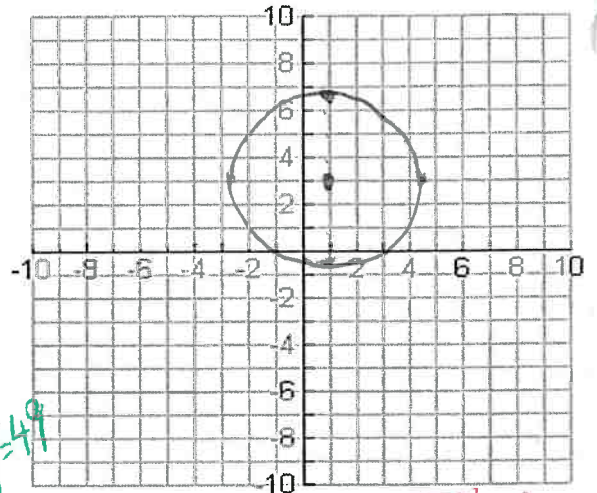
4. Use the equation $x^2 + (y-1)^2 = 4$ and identify the center and radius. Graph the circle.

$C(0,1)$
 $r = \sqrt{4}$
 $r = 2$



$$(x-1)^2 + (y-3)^2 = \sqrt{12}^2 \rightarrow (x-1)^2 + (y-3)^2 = 12$$

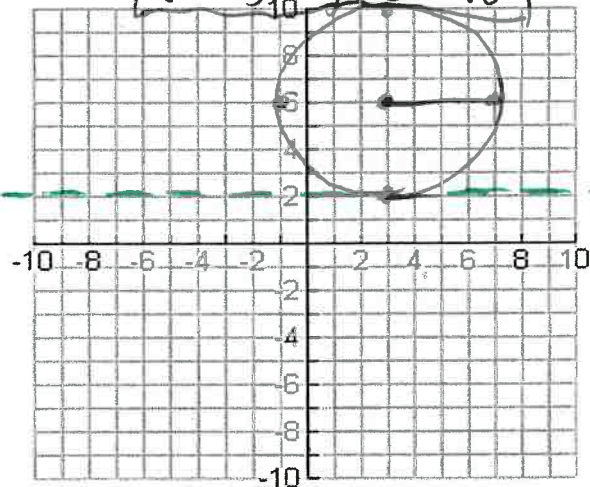
5. Write the equation of a circle with center $(1, 3)$ and radius $=\sqrt{12}$. Graph the circle.



6. Given a circle with center $(3, 6)$, draw a circle that is tangent to $y = 2$, then write the equation of the circle.

$$(x-3)^2 + (y-6)^2 = 16$$

$r = 4$



7. Put the equation of the circle into standard form. Identify the center and radius.

$$x^2 + y^2 + 14x = 2y - 41$$

$(\frac{14}{2})^2 \rightarrow (\frac{14}{2})^2 = 49$

$$x^2 + 14x + 49 + y^2 - 2y + 1 = -41 + 49 + 1$$

$$(x+7)(x+7) + (y-1)(y-1) = 9$$

$$(x+7)^2 + (y-1)^2 = 9$$

$r^2 = 9$
 $r = \sqrt{9} = 3$

$C(-7, 1)$
 $r = 3$

8. Find the equation of a circle whose center is at $(0, -8)$ and contains the point $(2, -5)$.

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

$$(2-0)^2 + (-5+8)^2 = r^2$$

$$2^2 + 3^2 = r^2$$

$$4 + 9 = r^2$$

$$r^2 = 13$$

$$(x-0)^2 + (y+8)^2 = 13$$

9. Find the equation of a circle whose diameter has endpoints at $(-13, -7)$ and $(11, 11)$.

Midpt $(\frac{-13+11}{2}, \frac{-7+11}{2}) \rightarrow$ Center $(-1, 2)$

$$(x+1)^2 + (y-2)^2 = 225$$

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

$$(11+1)^2 + (11-2)^2 = r^2$$

$$12^2 + 9^2 = r^2$$

$$144 + 81 = r^2$$

$$225 = r^2$$