

8.06c Parabolas and Circles Review WS #3

key

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

$(y-1)^2 = -8x$ $(y-1)^2 = -8(x-0)$ opens left

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

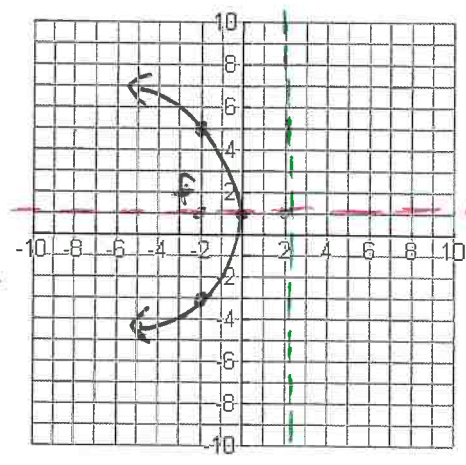
Vertex: $(0, 1)$

Focus: $(-2, 1)$

Directrix: $x = 2$

Axis of Symmetry: $y = 1$

Focal Width: 8



AOS $y = 1$

2. Write the equation of the parabola $y^2 - 8y + 4x = 12$ in standard form. Identify the vertex, focus, directrix, axis of symmetry, and focal width. Graph the parabola and label all parts.

Standard Form: $(y-4)^2 = -4(x-7)$

$4p = -4$ $p = -1$
 $p = -1$

Vertex: $(7, 4)$

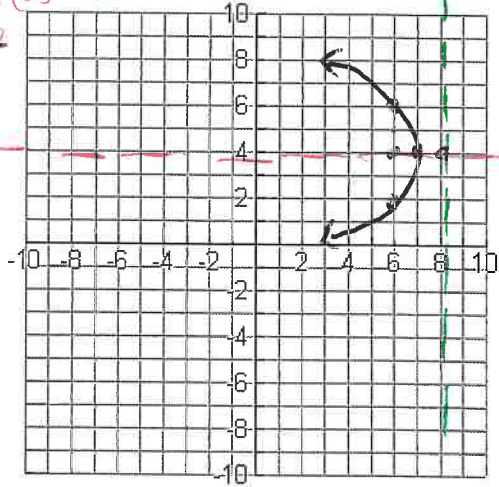
Focus: $(6, 4)$

Directrix: $x = 8$

Axis of Symmetry: $y = 4$

Focal Width: 4

$y^2 - 8y + 16 = -4x + 12 + 16$
 $(y-4)(y-4) = -4x + 28$
 $(y-4)^2 = -4(x-7)$



opens left

AOS $y = 4$

3. Write the standard form of the equation for the parabola with a vertex at $(3, 1)$ and directrix at $x = 5$ Identify its characteristics. Graph the parabola and label all parts.

Standard Form: $(y-1)^2 = -8(x-3)$

$p = -2$

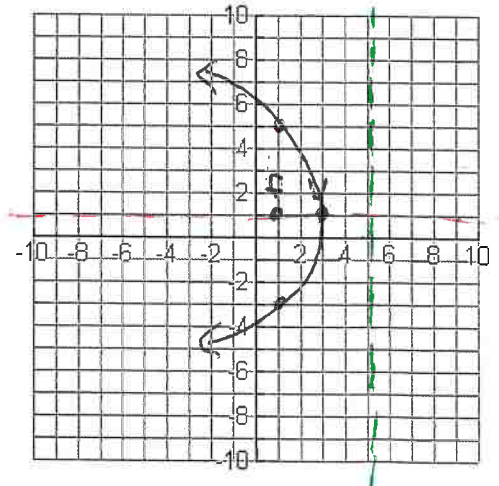
Vertex: $(3, 1)$

Directrix: $x = 5$

Axis of Symmetry: $y = 1$

Focal Width: 8

$(y-k)^2 = 4p(x-h)$
 $(y-1)^2 = 4(-2)(x-3)$



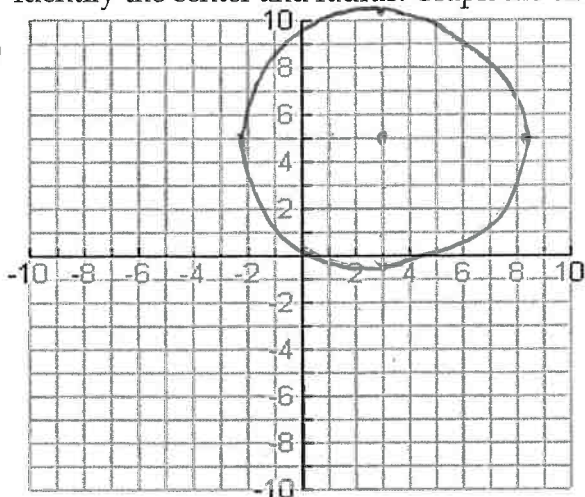
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AOS $y = 1$

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

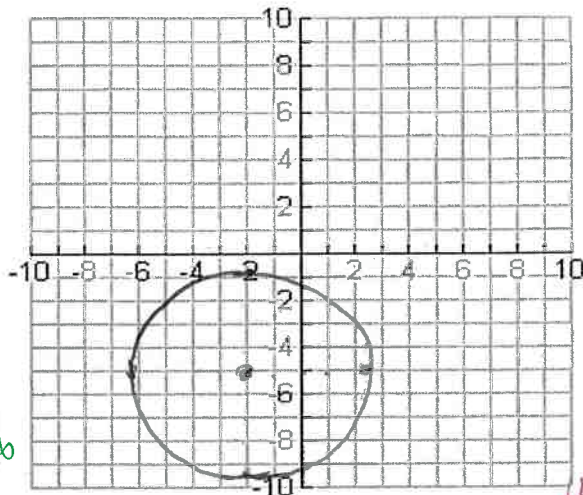
4. Use the equation $(x-3)^2 + (y-5)^2 = 26$ and identify the center and radius. Graph the circle.

$C(3,5)$
 $r = \sqrt{26}$
 $r \approx 5.1$



$$(x+2)^2 + (y+5)^2 = \sqrt{17}^2 \rightarrow (x+2)^2 + (y+5)^2 = 17$$

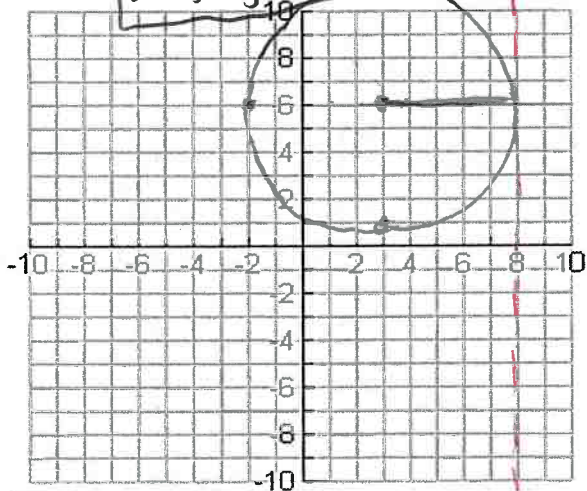
5. Write the equation of a circle with center $(-2, -5)$ and radius $=\sqrt{17}$. Graph the circle.



6. Given a circle with center $(3, 6)$, draw a circle that is tangent to $x=8$, then write the equation of the circle.

$$(x-3)^2 + (y-6)^2 = 25$$

$r=5$



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

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

$(\frac{b}{2})^2 = (\frac{-8}{2})^2 = 16$

$(\frac{c}{2})^2 = 4$

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

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

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

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

8. Find the equation of a circle whose center is at $(5, 9)$ and contains the point $(7, 8)$.

$$(x-h)^2 + (y-k)^2 = r^2 \quad | \quad r^2 = 5$$

$$(7-5)^2 + (8-9)^2 = r^2$$

$$2^2 + 1^2 = r^2$$

$$(x-5)^2 + (y-9)^2 = 5$$

9. Find the equation of a circle whose diameter has endpoints at $(-5, -8)$ and $(7, 2)$.

Midpt: $(\frac{-5+7}{2}, \frac{-8+2}{2})$

Center: $(1, -3)$

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

$$(7-1)^2 + (2+3)^2 = r^2$$

$$6^2 + 5^2 = r^2$$

$$36 + 25 = r^2$$

$$r^2 = 61$$

$$(x-1)^2 + (y+3)^2 = 61$$