

CCGPS Analytic Geometry Unit 6 Review 2

Circles, Parabolas, Systems of Equations

Equations: $(x - h)^2 + (y - k)^2 = r^2$ $(x - h)^2 = 4p(y - k)$ $(y - k)^2 = 4p(x - h)$

Graph the equation and identify the important characteristics

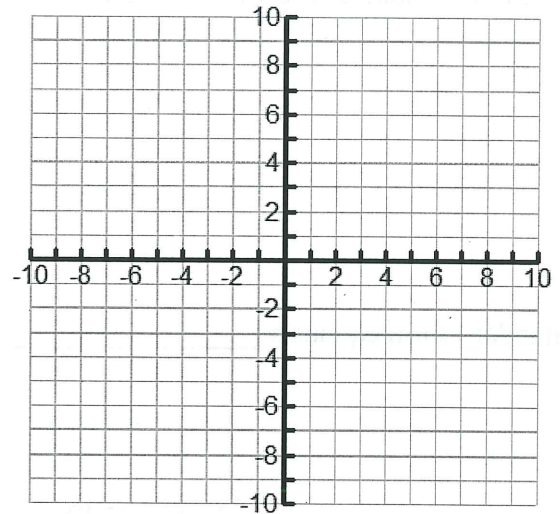
1. $8y + x^2 - 4x + 1 = 5$

Standard Form: _____

Opens: _____ Vertex: _____ p = _____

Focus: _____ Directrix: _____

Focal Width: _____ Axis of Symmetry: _____



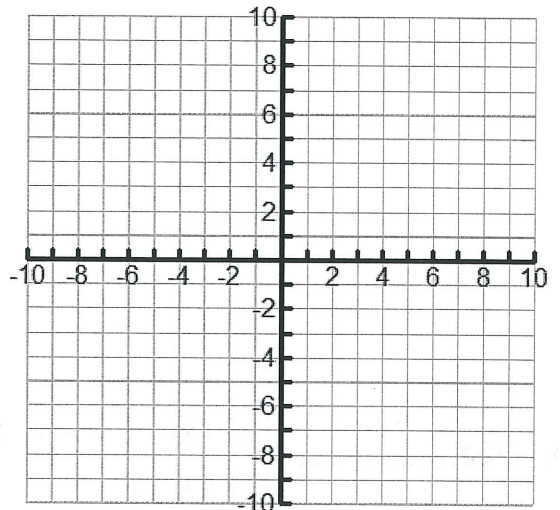
Write the equation for each circle in standard form. Then identify the center and radius.

2. The endpoints of a diameter are at $(-4, 4)$ and at $(-8, 2)$.

Equation: _____

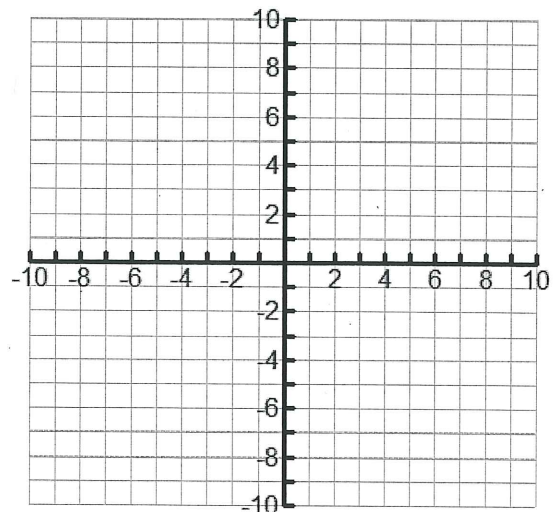
Center: _____ Radius: _____

3. $x^2 + y^2 + 2x - 4y - 11 = 0$



Standard Form Equation : _____

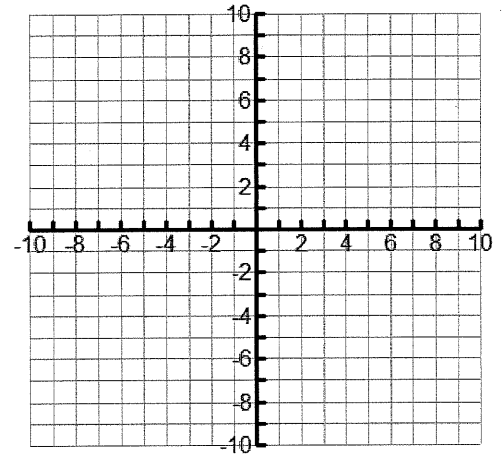
Center: _____ Radius: _____



6. Given the circle with a center at $(-2, 6)$ and a radius of $5\sqrt{2}$.

Write the equation of the circle in standard form: _____

7. Find the standard form of the equation for the parabola with a focus located at $(-1, -2)$ and directrix at $x=5$



Standard form equation _____

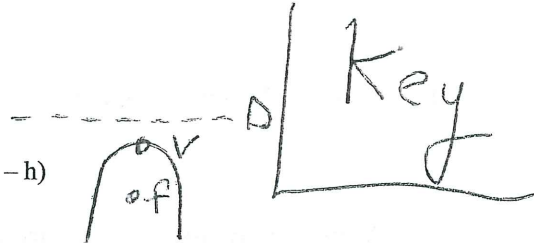
8. Solve the system $\begin{cases} x^2 + y^2 = 36 \\ x + y + 6 = 0 \end{cases}$ using algebra. SHOW ALL WORK.

9. Solve the system $\begin{cases} y^2 + 8x - 6y + 9 = -8 \\ 2x + y = 1 \end{cases}$ using algebra. SHOW ALL WORK.

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Circles, Parabolas, Systems of Equations

Equations: $(x-h)^2 + (y-k)^2 = r^2$ $(x-h)^2 = 4p(y-k)$ $(y-k)^2 = 4p(x-h)$



Graph the equation and identify the important characteristics

1. $8y + x^2 - 4x + 1 = 5$

$$x^2 - 4x + \underline{4} = -8y + 4 + \underline{4} \quad \left| \begin{array}{l} (x-2)^2 = -8y + 8 \\ (x-2)^2 = -8(y-1) \end{array} \right.$$

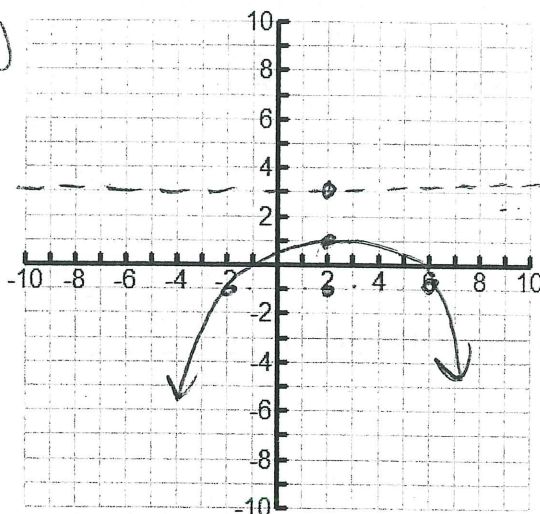
$$\left(\frac{b}{2}\right)^2 = \left(\frac{-4}{2}\right)^2 = (-2)^2 = 4$$

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

Opens: down Vertex: $(2, 1)$ $p = -2$

Focus: $(2, -1)$ Directrix: $y = 3$

Focal Width: 8 Axis of Symmetry: $x = 2$



Write the equation for each circle in standard form. Then identify the center and radius.

2. The endpoints of a diameter are at $(-4, 4)$ and at $(-8, 2)$.

$$\text{Midpt} \left(\frac{-4-8}{2}, \frac{4+2}{2} \right) = \left(\frac{-12}{2}, \frac{6}{2} \right) = (-6, 3)$$

center $(-6, 3)$ $(x-h)^2 + (y-k)^2 = r^2$

point $(-4, 4)$ $(-4+6)^2 + (4-3)^2 = r^2$

Equation: $(x+6)^2 + (y-3)^2 = 4$

Center: $(-6, 3)$

Radius: $\sqrt{5} \approx 2.24$

3. $x^2 + y^2 + 2x - 4y - 11 = 0$

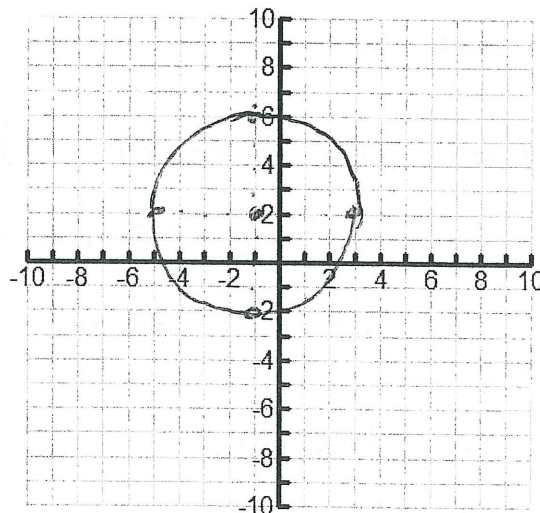
$$x^2 + 2x + \underline{1} + y^2 - 4y + \underline{4} = 11 + \underline{1} + \underline{4}$$

$$\left(\frac{2}{2}\right)^2 = (1)^2 = 1 \quad \left| \quad (x \quad)^2 + (y \quad)^2 = 16 \right.$$

$$\left(\frac{-4}{2}\right)^2 = (-2)^2 = 4 \quad \left| \quad (x+1)^2 + (y-2)^2 = 16 \right.$$

Standard Form Equation: $(x+1)^2 + (y-2)^2 = 16$

Center: $(-1, 2)$ Radius: 4



4. Given the circle with a center at $(-2, 6)$ and a radius of $(5\sqrt{2})^2 = r^2 = 50$

Write the equation of the circle in standard form: $(x+2)^2 + (y-6)^2 = 50$

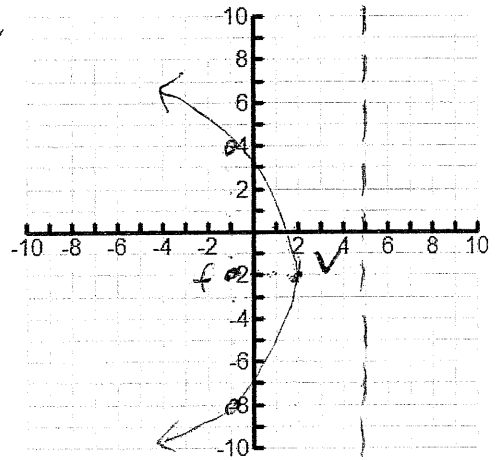
5. Find the standard form of the equation for the parabola with a focus located at $(-1, -2)$ and directrix at $x=5$

Vertex (h, k)
 $(2, -2)$

$p = -3$

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

↙ opens left



Standard form equation $(y+2)^2 = -12(x-2)$

6. Solve the system $\begin{cases} x^2 + y^2 = 36 \\ x + y + 6 = 0 \end{cases}$ using algebra. SHOW ALL WORK.

$y = -6 - x$

$x^2 + (-6-x)^2 = 36$

$x^2 + (-6-x)(-6-x) = 36$

$x^2 + 36 + 6x + 6x + x^2 - 36 = 0$

$2x^2 + 12x = 0$

$2x(x+6) = 0$

$2x = 0 \quad | \quad x + 6 = 0$

$x = 0 \quad | \quad x = -6$

$(0, -) \quad | \quad (-6, -)$

$y = -6 - x$

$(0, -6)$ and $(-6, 0)$

7. Solve the system $\begin{cases} y^2 + 8x - 6y + 9 = -8 \\ 2x + y = 1 \end{cases}$ using algebra. SHOW ALL WORK.

$y = 1 - 2x$

$(1-2x)^2 + 8x - 6(1-2x) + 9 + 8 = 0$

$(1-2x)(1-2x) + 8x - 6 + 12x + 17 = 0$

$1 - 2x - 2x + 4x^2 + 20x + 11 = 0$

$4x^2 + 16x + 12 = 0$

$\begin{array}{r} 3 \quad 3 \\ \cancel{3} \quad \cancel{1} \\ 1 \quad 4 \quad 1 \end{array}$

$4(x^2 + 4x + 3) = 0$

$4(x+3)(x+1) = 0$

$x+3=0 \quad | \quad x+1=0$

$x=-3 \quad | \quad x=-1$

$(-3, -) \quad | \quad (-1, -)$

$y = 1 - 2x$

$(-3, 7)$ and

$(-1, 3)$