Name_____ Date _____ Period _____

Conics – Circle

Page 2

Standard Form of the Equation of a Circle: $(x-h)^2+(y-k)^2=r^2$

Where (h, k) is the center and r is the radius.

General Form of the Equation of a Circle: $x^2+y^2+Dx+Ey+F=0$

Example: A circle is centered at (3, 2) with a radius 5. Write the equation of the circle in Standard Form:

How can we change from Standard Form to General Form?

General Form:

How do we change from general to standard form?

Write the standard form of the equation for the circle below.

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

Steps:

1. Group x's and y's then move the constant to the other side of equation.
2. Complete the square with x's, be sure to **balance** the equation.
3. Complete the square with y's, be sure to **balance** the equation.
4. Express each perfect square trinomial as a binomial squared.

Use the information provided to write the standard form equation of each circle.

1.) $137+6y=-y^2-x^2-24x$

2.) $8x+x^2-2y=64-y^2$

Standard Form: _____

Center: _____

Radius: _____

Standard Form: _____

Center: _____

Radius: _____

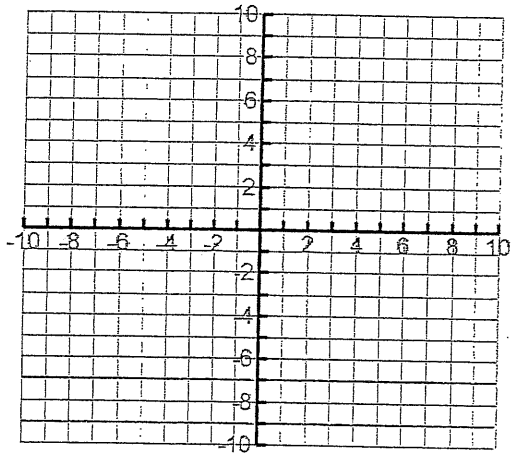
Name_____ Date _____ Period _____

Write the standard equation for each circle, state the coordinates of the center and the radius. Then, graph the circle.

1. $x^2 + y^2 + 6x + 6y + 9 = 0$

Center: _____

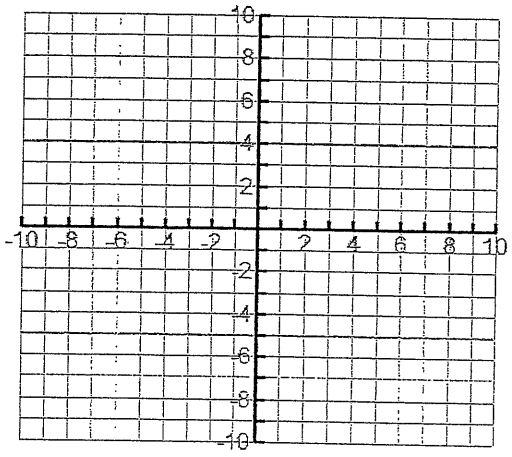
Radius: _____



2. $x^2 - 2x + y^2 = 8$

Center: _____

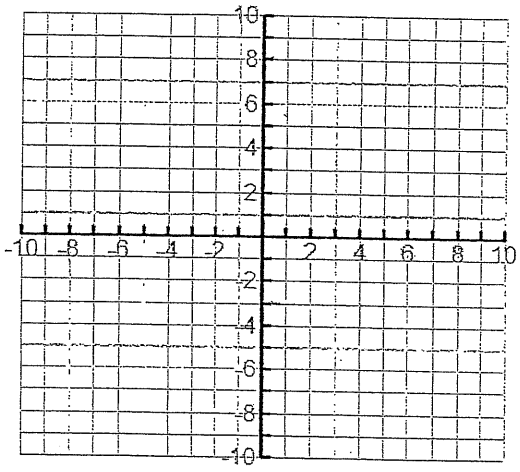
Radius: _____



3. $x^2 + y^2 - 10x - 2y = 23$

Center: _____

Radius: _____



Name _____ Date _____ Period _____

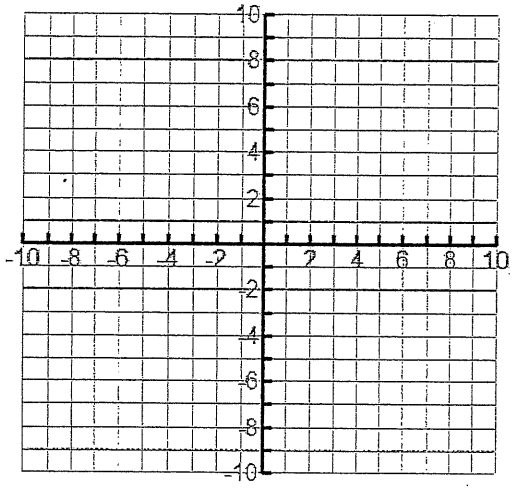
CCGPS Analytic Geometry
Circles – Homework Unit 6: Day 2

Graph the following circles. State the Center and Radius for each.

1.) $5x^2 + 5y^2 = 125$

Center: _____

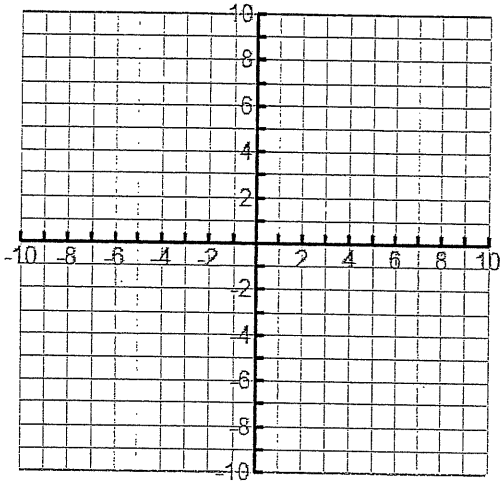
Radius: _____



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

Center: _____

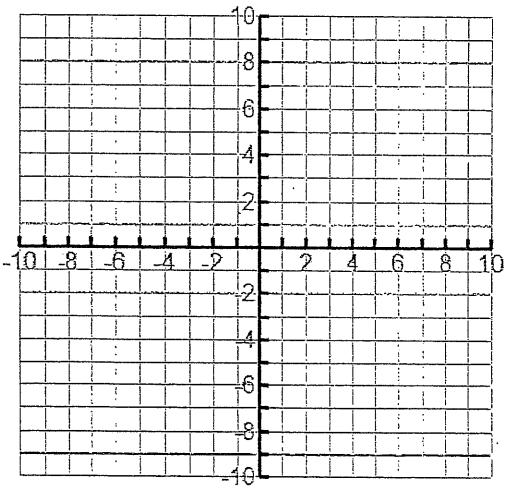
Radius: _____



3.) $x^2 + y^2 + 6x + 6y + 9 = 0$

Center: _____

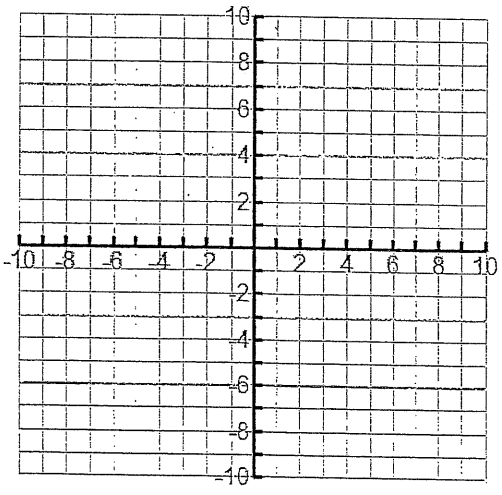
Radius: _____



4.) $4x^2 - 20x + 4y^2 = -21$

Center: _____

Radius: _____

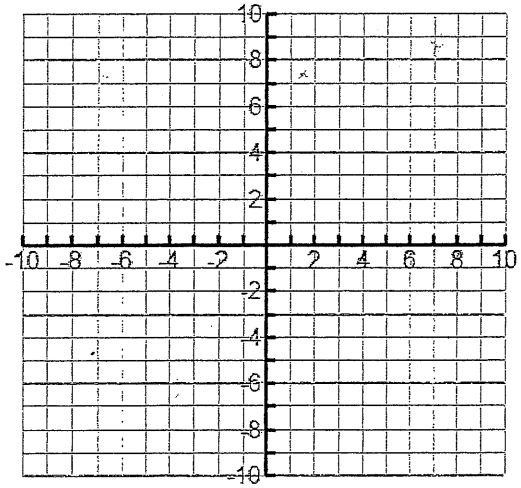


Name _____ Date _____ Period _____

5.) $x^2 - 2x + y^2 = 8$

Center: _____

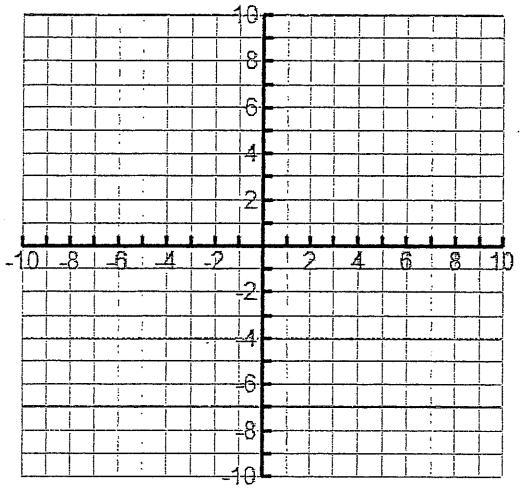
Radius: _____



6.) $x^2 + y^2 - 10x - 2y = 23$

Center: _____

Radius: _____



7. Write the equation of a circle with center (2, - 4) and radius of 5.

8. Write the equation of a circle with center (1, 2) that goes through the point (0, - 3).

9. Write the equation of the circle that has a diameter with endpoints (9, 4) and (- 1, 0).

Name_____ Date _____ Period Key

Conics - Circle

Page 2

Standard Form of the Equation of a Circle: $(x-h)^2+(y-k)^2=r^2$

Where (h, k) is the center and r is the radius.

General Form of the Equation of a Circle: $x^2+y^2+Dx+Ey+F=0$

Example: A circle is centered at (3, 2) with a radius 5. Write the equation of the circle in Standard Form:

$(x-3)^2+(y-2)^2=5^2$

How can we change from Standard Form to General Form?

General Form: $x^2-6x+9+y^2-4y+4=25$

$x^2+y^2-6x-4y-12=0$

How do we change from general to standard form? Complete the square $\left(\frac{b}{2}\right)^2$

Write the standard form of the equation for the circle below.

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

$x^2+4x+\underline{4}+y^2-8y+\underline{16}=-4+\underline{4}+\underline{16}$

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

Steps:

1. Group x's and y's then move the constant to the other side of equation. $\left(\frac{b}{2}\right)^2=\left(\frac{4}{2}\right)^2=2^2=4$
2. Complete the square with x's, be sure to **balance** the equation. $\left(\frac{-8}{2}\right)^2=-4^2=16$
3. Complete the square with y's, be sure to **balance** the equation.
4. Express each perfect square trinomial as a binomial squared.

Use the information provided to write the standard form equation of each circle.

1.) $137+6y=-y^2-x^2-24x$

$x^2+24x+\underline{144}+y^2+6y+\underline{9}=-137+\underline{144}+\underline{9}$

$(x+12)^2+(y+3)^2=16$

Standard Form: _____

Center: $(-12,-3)$

Radius: 4

2.) $8x+x^2-2y=64-y^2$

$x^2+8x+\underline{16}+y^2-2y+\underline{1}=64+\underline{16}+\underline{1}$

$(x+4)^2+(y-1)^2=81$

Standard Form: _____

Center: $(-4,1)$

Radius: 9

Name_____ Date _____ Period _____

Write the standard equation for each circle, state the coordinates of the center and the radius. Then, graph the circle.

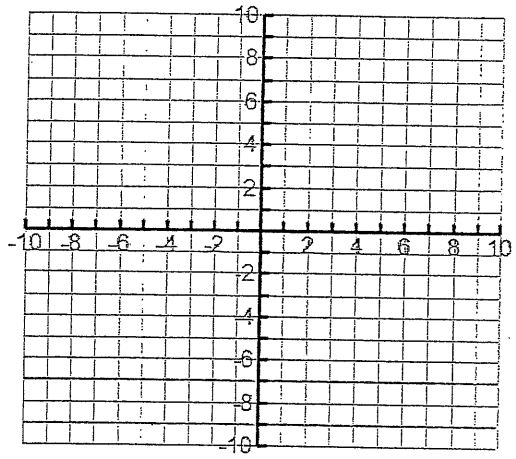
1. $x^2 + y^2 + 6x + 6y + 9 = 0$

Center: $(-3, -3)$

Radius: $r = 3$

$x^2 + 6x + \underline{9} + y^2 + 6y + \underline{9} = -9 + \underline{9} + \underline{9}$

$(x+3)^2 + (y+3)^2 = 9$



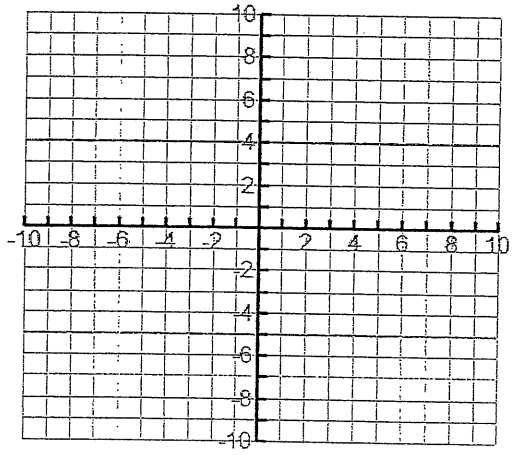
2. $x^2 - 2x + y^2 = 8$

Center: $(1, 0)$

Radius: 3

$x^2 - 2x + \underline{1} + y^2 = 8 + \underline{1}$

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



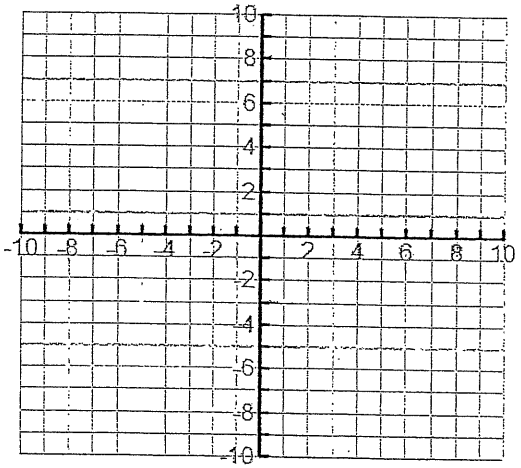
3. $x^2 + y^2 - 10x - 2y = 23$

Center: $(5, 1)$

Radius: 7

$x^2 - 10x + \underline{25} + y^2 - 2y + \underline{1} = 23 + \underline{25} + \underline{1}$

$(x-5)^2 + (y-1)^2 = 49$



Name _____ Date _____ Period _____

CCGPS Analytic Geometry
Circles – Homework Unit 6: Day 2

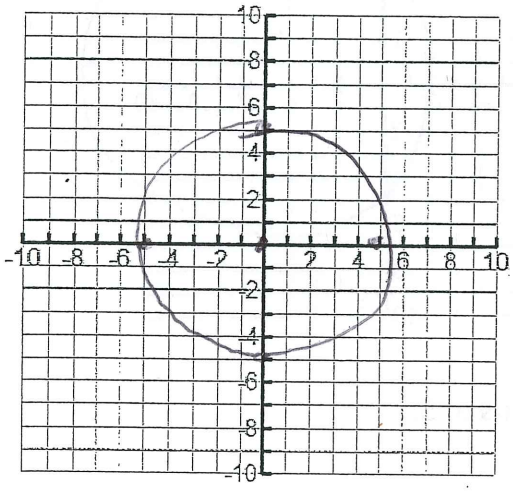
Graph the following circles. State the Center and Radius for each.

1.) $5x^2 + 5y^2 = 125$

$\frac{5}{5} \quad \frac{5}{5} \quad \frac{125}{5}$ $x^2+y^2=25$

Center: (0,0)

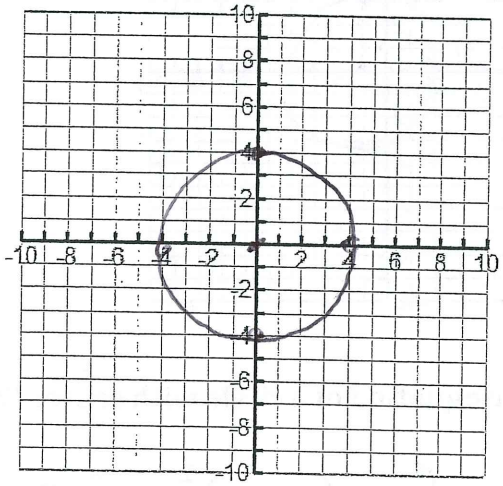
Radius: 5



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

Center: (0,0)

Radius. $r=4$

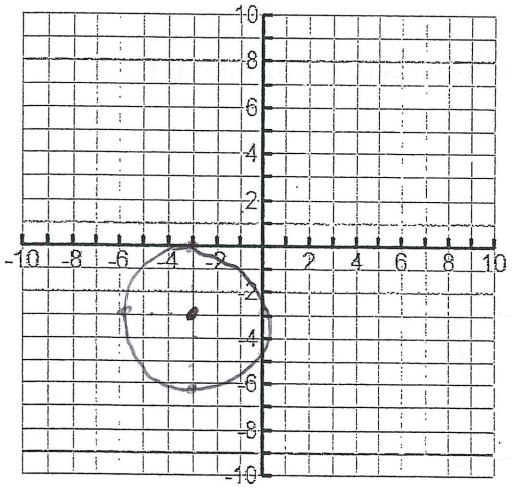


3.) $x^2+y^2+6x+6y+9=0$

$x^2+6x+\_+y^2+6y+\_ = -9+\_+\_$

Center: (-3,-3) $(x+3)^2+(y+3)^2=9$

Radius: 3

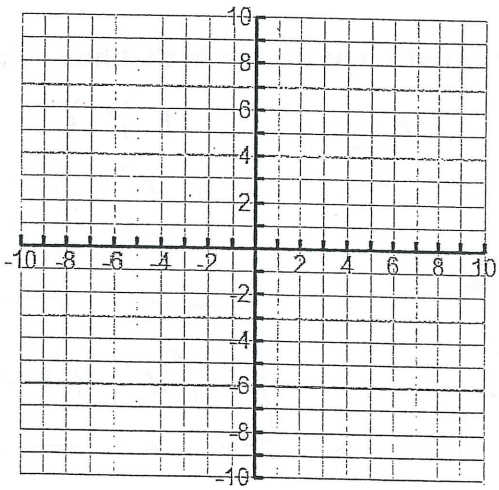


4.) $4x^2 - 20x + 4y^2 = -21$

$4(x^2-5x+\_)+4y^2 = -21+\_+\_$

Center: _____

Radius: _____



Name _____ Date _____ Period _____

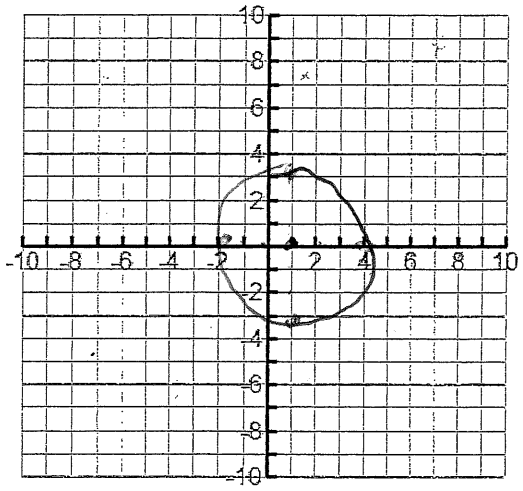
5.) $x^2 - 2x + y^2 = 8$

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

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

Center: $(1, 0)$

Radius: 3



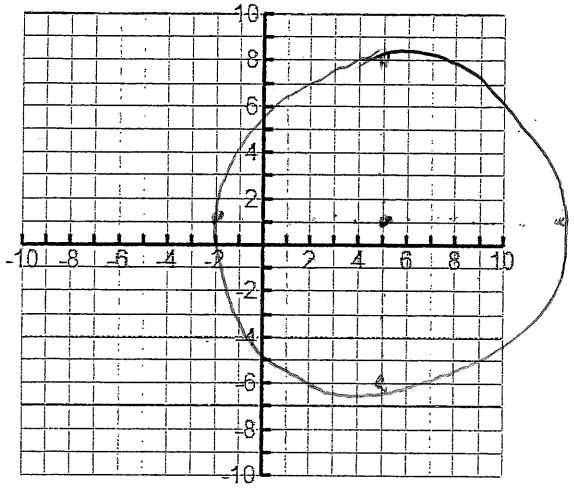
6.) $x^2 + y^2 - 10x - 2y = 23$

$x^2-10x+25+y^2-2y+1=23+25+1$

$(x-5)^2+(y-1)^2=49$

Center: $(5, 1)$

Radius: 7



7. Write the equation of a circle with center (2, - 4) and radius of 5.

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

8. Write the equation of a circle with center (1, 2) that goes through the point (0, - 3).

$r^2=(0-1)^2+(-3-2)^2$ (h, k) (x, y)

$r^2=1+25$

$r^2=26$

$(x-1)^2+(y-2)^2=26$

9. Write the equation of the circle that has a diameter with endpoints (9, 4) and (- 1, 0).

$\frac{9-1}{2}, \frac{4+0}{2}$

$\frac{8}{2}, 2$

$(4, 2)$

$r^2=(9-4)^2+(4-2)^2$

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

$r^2=29$

$(x-4)^2+(y-2)^2=29$