

Equation of a Circle WS
Geometry Section 9.6

Name: key
Period: _____

Equation of a circle: $(x - h)^2 + (y - k)^2 = r^2$

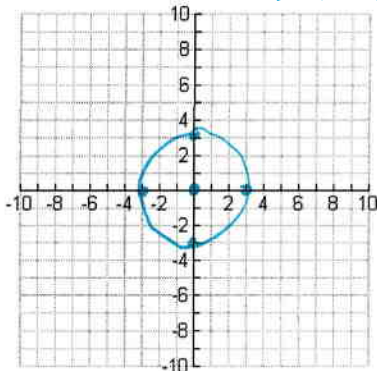
Center of the circle: (h, k)

1. State the center and radius of each circle. Then, graph each circle.

a. $x^2 + y^2 = 9$

$(h, k) = (0, 0)$

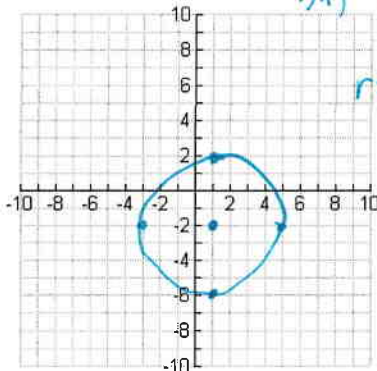
$r = 3$



b. $(x-1)^2 + (y+2)^2 = 16$

$(h, k) = (1, -2)$

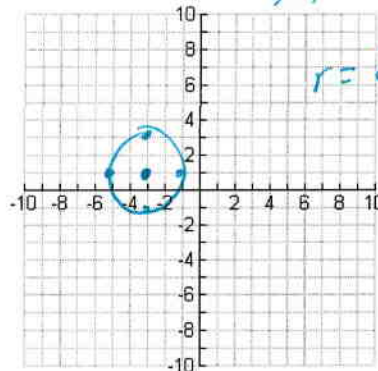
$r = 4$



c. $(x+3)^2 + (y-1)^2 = 4$

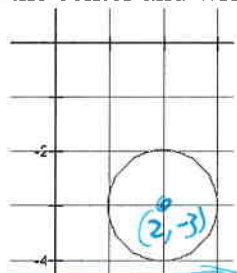
$(h, k) = (-3, 1)$

$r = 2$



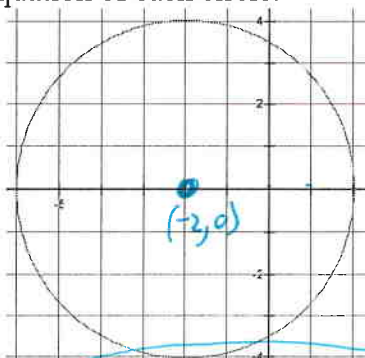
2. Find the center and write the equation of each circle.

a.



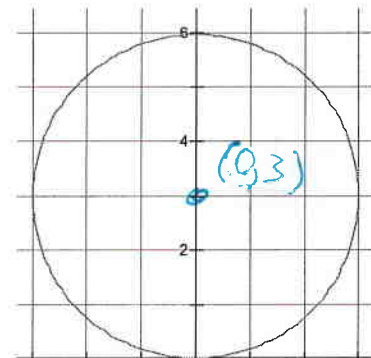
$(x-2)^2 + (y+3)^2 = 1$

b.



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

c.



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

3. Find the equation of a circle with center $(5, -9)$ and radius 7.

$(x-5)^2 + (y+9)^2 = 49$

4. Find the diameter of the circle $(x-4)^2 + (y-8)^2 = 169$.

$r = 13$

$d = 26$

5. Find the equation of a circle with center $(0, 0)$ through the point $(2, 5)$.

$r = d = \sqrt{5^2 + 2^2} = \sqrt{29}$

$x^2 + y^2 = 29$

6. Find the equation of a circle with endpoints of a diameter $(3, -4)$ and $(-7, -4)$.

7. Find the area and circumference of the circle $(x+3)^2 + (y-6)^2 = 36$.

$r = 6$

$A = 36\pi$

$C = 12\pi$

8. Find the equation of a circle with center $(-1, 5)$ through the point $(2, 0)$.

$r = \sqrt{(2+1)^2 + (0-5)^2} = \sqrt{3^2 + 5^2} = \sqrt{9+25} = \sqrt{34}$

$(x+1)^2 + (y-5)^2 = 34$

9. Find the equation of a circle with endpoints of a diameter $(3, 2)$ and $(-5, 0)$.

$MP = \left(\frac{3-5}{2}, \frac{2+0}{2}\right) = (-1, 1) \leftarrow \text{center}$

$r = \sqrt{(3+1)^2 + (2-1)^2} = \sqrt{17}$

$(x+1)^2 + (y-1)^2 = 17$

10. Find the equation of a circle with area 64π and center $(7, 0)$.

$(x-7)^2 + y^2 = 64$

$A = \pi r^2$
 $64\pi = \pi r^2$
 $r = 8$