12-5 Circles in the Coordinate Plane

The equation of a circle with center at (h, k) and radius r is

The equation of a circle with center at the **origin** and radius r is
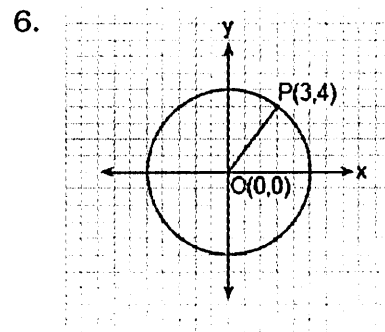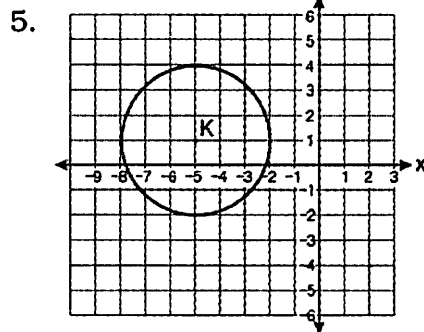
For 1-6, find the equation of the circle with...

1. center: (-3 , 7) and radius of 9

2. center: origin and radius of $\sqrt{41}$

3. center (0 , -8) and radius of 3

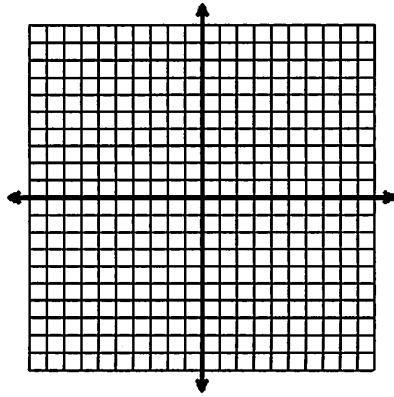4. center: (-1, -4) and point (-4, 0)

5.

6.

For 7 and 8, name the center and the radius of the circle.
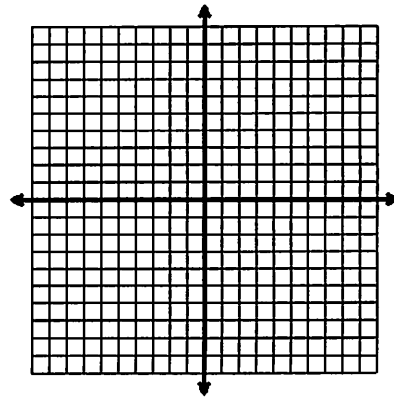
7. $x^2 + (y-7)^2 = 16$

8. $(x+5)^2 + (y+1)^2 = 48$

For 9 and 10, find the center and radius of the circle. Then graph the circle.

9. $x^2 + (y-3)^2 = 36$

10. $(x+1)^2 + (y+1)^2 = 9$

11. Write the equation of the circle whose diameter $\overline{AB}$ has endpoints (-4, 2) and (4, -4).

12. Find the circumference and area, in terms of π, of the circle with equation $(x-9)^2 + (y-3)^2 = 64$.

13. Write the equation of a circle with an area of 36π and center at (4 , 7).

14. The line represented by the equation $y = -\frac{4}{3}x + 11$ is tangent to a circle at (6, 3). If the center of the circle lies on the x-axis, find the equation of the circle.

12-5 Circles in the Coordinate Plane

The equation of a circle with center at (h, k) and radius r is

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

The equation of a circle with center at the **origin** and radius r is

$$x^2 + y^2 = r^2$$

For 1-6, find the equation of the circle with...

1. center: (-3 , 7) and radius of 9

$$(x+3)^2 + (y-7)^2 = 81$$

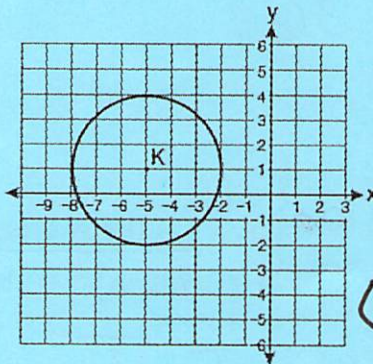2. center: origin and radius of $\sqrt{41}$

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

3. center (0 , -8) and radius of 3

$$x^2 + (y+8)^2 = 9$$

4. center: (-1, -4) and point (-4, 0)

$$d = \sqrt{(-1+4)^2 + (-4-0)^2}$$
$$= \sqrt{-3^2 + -4^2}$$
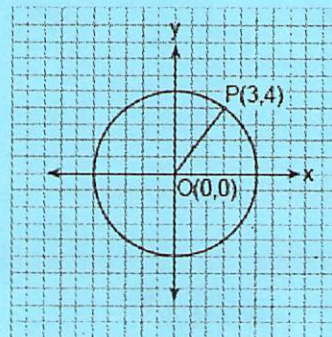$$= \sqrt{25} = 5$$

$$(x+1)^2 + (y+4)^2 = 25$$

5.

center
$(-5,1)$
radius: 3

$$(x+5)^2 + (y-1)^2 = 9$$

6.

center
$(0,0)$
$r = 5$

$$x^2 + y^2 = 25$$

For 7 and 8, name the center and the radius of the circle.

7. $x^2 + (y-7)^2 = 16$

Center $(0, 7)$

radius: 4
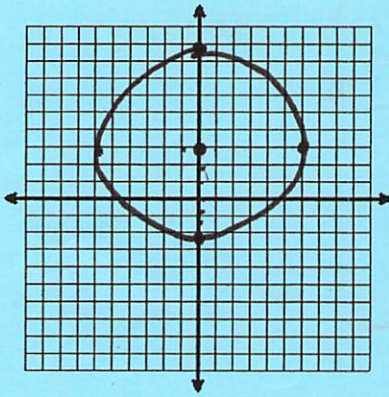
8. $(x+5)^2 + (y+1)^2 = 48$
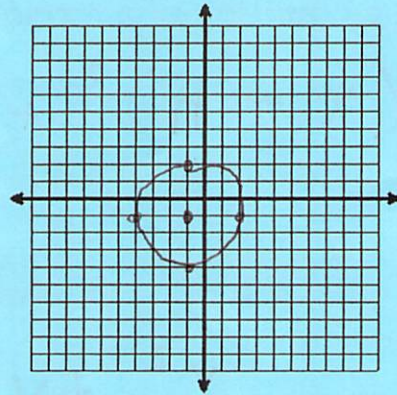
center: $(-5, -1)$

$r = 4\sqrt{3}$

For 9 and 10, find the center and radius of the circle. Then graph the circle.

9. $x^2 + (y-3)^2 = 36$

center:
$(0, 3)$

radius:

6

10. $(x+1)^2 + (y+1)^2 = 9$

Center:
$(-1, -1)$

$r = 3$

11. Write the equation of the circle whose diameter $\overline{AB}$ has endpoints (-4, 2) and (4, -4).

$M = (0, -1)$ $r = \sqrt{(4-0)^2 + (-4+1)^2}$
$= \sqrt{4^2 + (-3)^2}$
$= \sqrt{25} = 5$

$x^2 + (y+1)^2 = 25$

12. Find the circumference and area, in terms of π, of the circle with equation $(x-9)^2 + (y-3)^2 = 64$.

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

$C = 16\pi$ $A = 64\pi$

13. Write the equation of a circle with an area of 36π and center at (4 , 7).

$A = \pi r^2$

$36\pi = \pi r^2$

$r = 6$

$(x-4)^2 + (y-7)^2 = 36$

14. The line represented by the equation $y = -\frac{4}{3}x + 11$ is tangent to a circle at (6, 3). If the center of the circle lies on the x-axis, find the equation of the circle.

$r = \sqrt{(6-2)^2 + (0-3)^2}$

$m_\perp = \frac{3}{4}$ ʏ⃥ᴍᴀ⃥ᴍ   Center
                                Lies   on   x-axis $r = \sqrt{25} = 5$
$(6, 3)$ $(x, 0)$

$y = mx + b$ $0 = \frac{3}{4}(x) - \frac{3}{2}$ $(x-2)^2 + y^2 = 25$
$3 = \frac{3}{4}(6) + b$
$b = -\frac{3}{2}$ $y = \frac{3}{4}x - \frac{3}{2}$ $2 = x$

                                        Center = (2, 0)