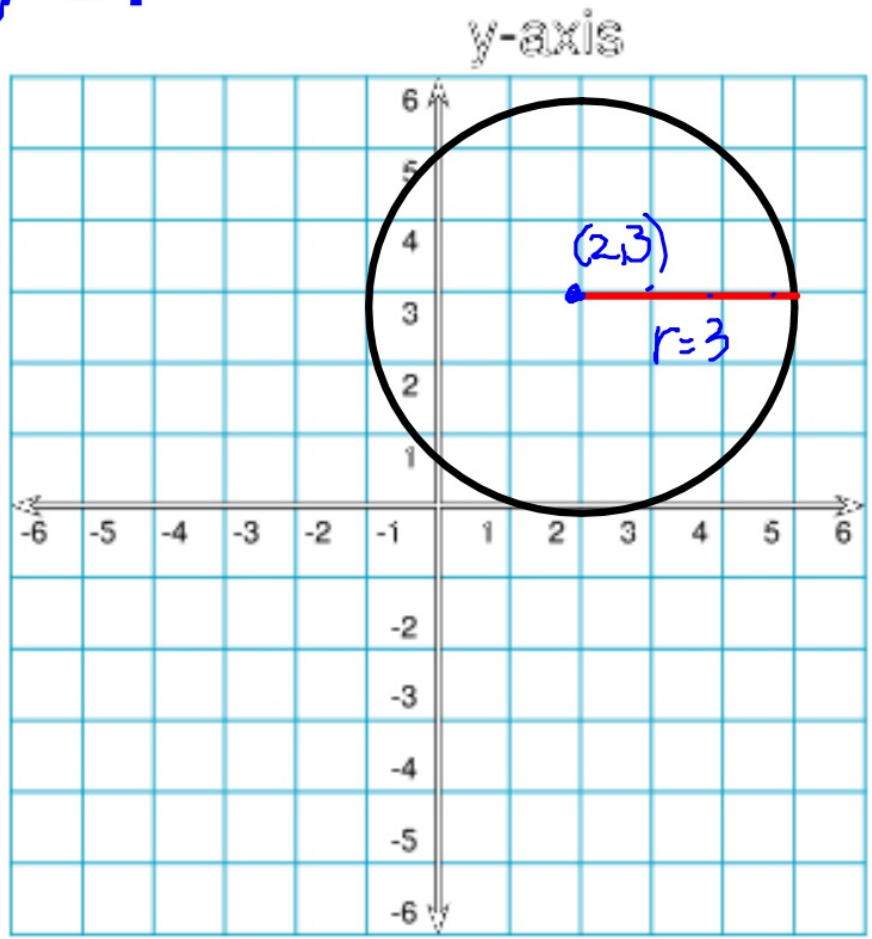
CHAPTER 13:
COORDINATE GEOMETRY

SECTION 13.1
Equations of Circles

EQUATION OF A CIRCLE

An equation of the circle with center (a, b) and radius r:

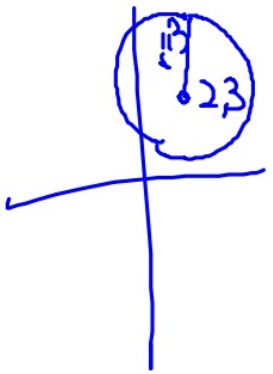
$$(x - a)^2 + (y - b)^2 = r^2$$



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

$c = (2, 3)$

$r = 3$



10-12: Write an equation of the circle that has the given center and radius.

10) $C(0,0)$ $r=9$

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

Answer $x^2 + y^2 = 81$

10-12: Write an equation of the circle that has the given center and radius.

11) $C(-3,-8)$ **r=6**

$$(x-(-3))^2 + (y-(-8))^2 = 6^2$$

Answer $(x+3)^2 + (y+8)^2 = 36$

10-12: Write an equation of the circle that has the given center and radius.

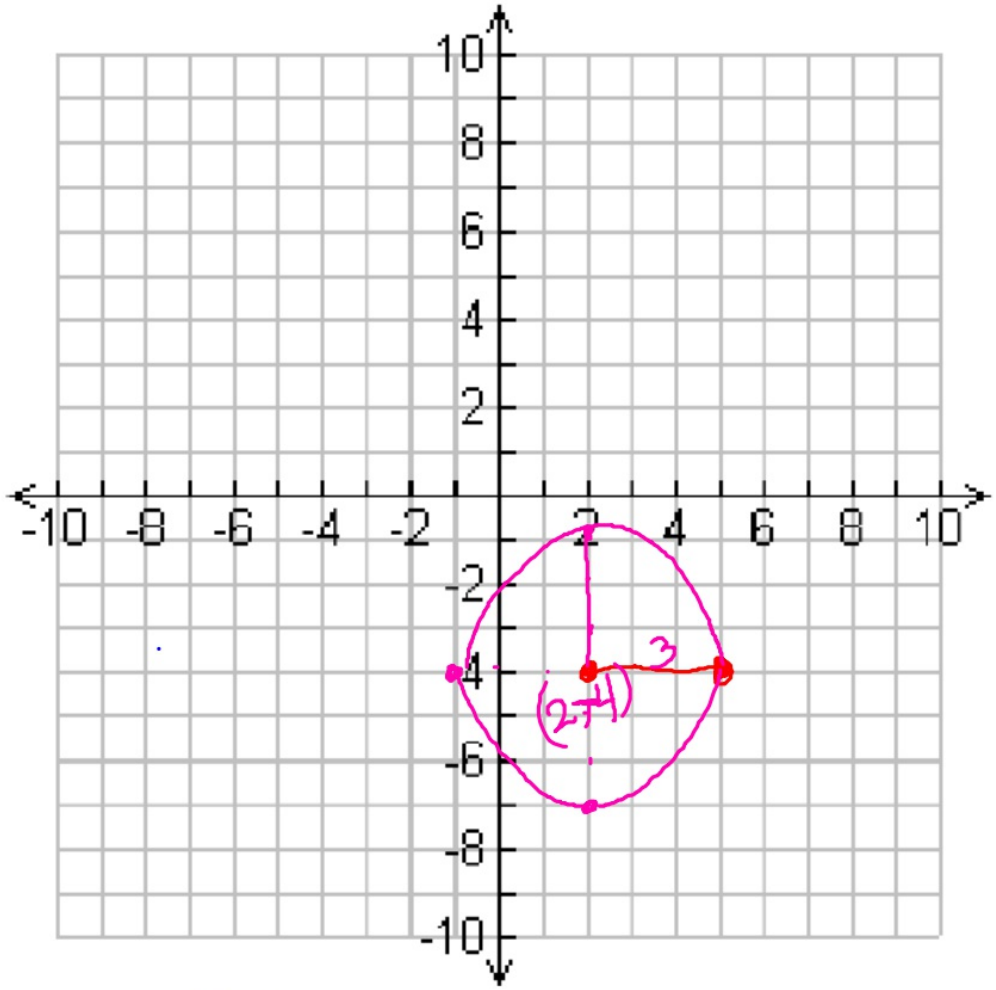
12) $C(1,-2)$ $r=\sqrt{3}$

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

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

13-15: Find the center and radius of each circle. Sketch the graph.

13) $(x-2)^2+(y+4)^2=\sqrt{9}$



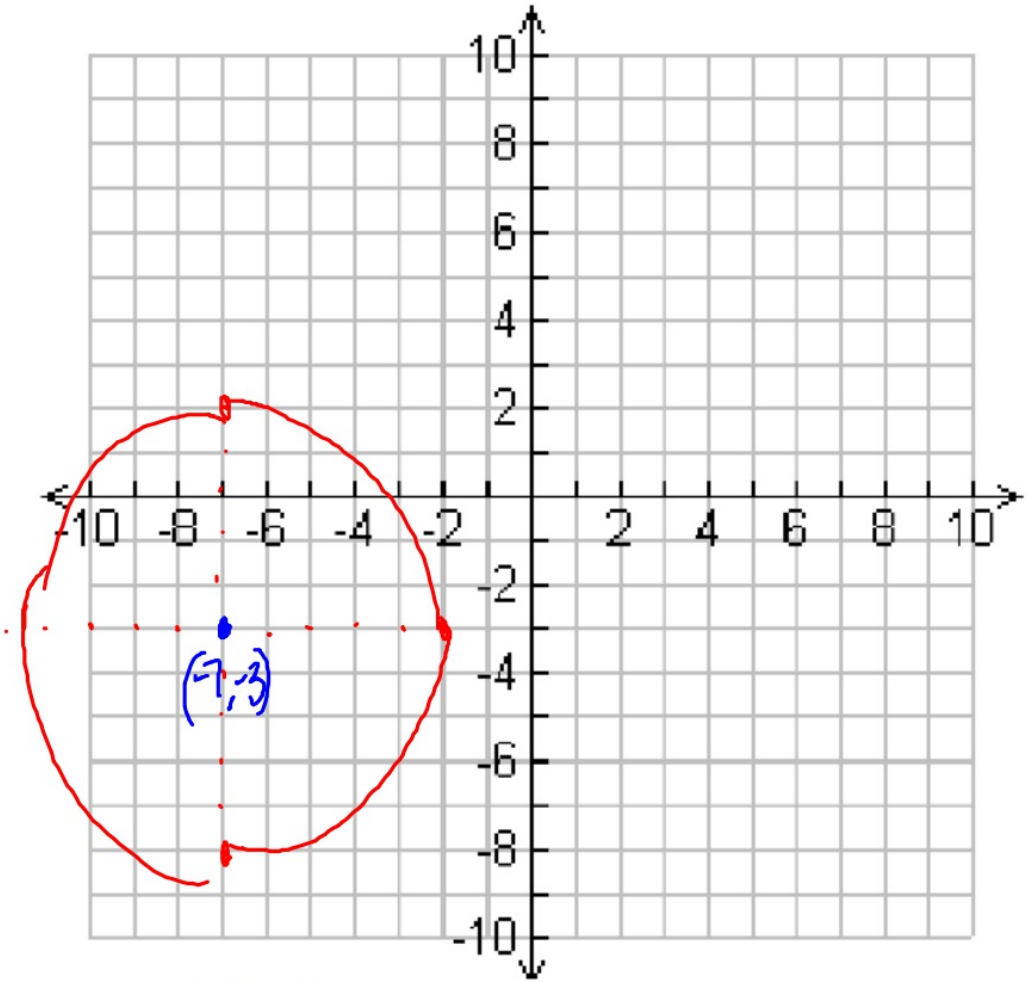
$C=(2,-4)$

$r=3$

Answer

13-15: Find the center and radius of each circle. Sketch the graph.

14) $(x+7)^2+(y+3)^2=\sqrt{25}$



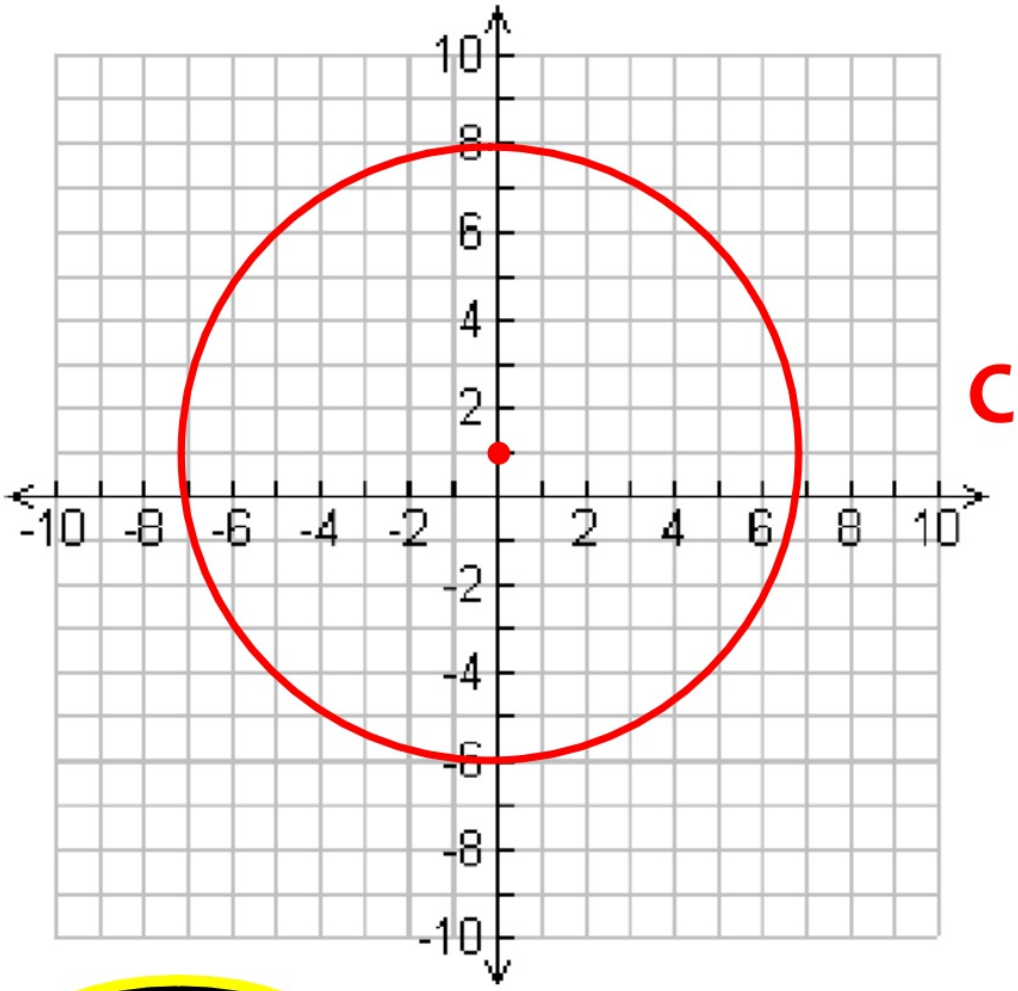
$C=(-7,-3)$

$r=5$

Answer

13-15: Find the center and radius of each circle. Sketch the graph.

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



C(0,1); r=7

Answer

11. Find the center and the radius of each circle.

a. $(x - 2)^2 + y^2 = 1$ **b.** $(x + 2)^2 + (y - 8)^2 = 16$

c. $x^2 + (y + 5)^2 = 112$ **d.** $(x + 3)^2 + (y + 7)^2 = 14$

12. Find an equation of the circle that has the given center and radius.

a. Center (2, 5); radius 3 **b.** Center $(-2, 0)$; radius 5

c. Center $(-2, 3)$; radius 10 **d.** Center (j, k); radius n

Find the center and the radius of each circle.

17. $(x + 3)^2 + y^2 = 49$ **18.** $(x + 7)^2 + (y - 8)^2 = \frac{36}{25}$

19. $(x - j)^2 + (y + 14)^2 = 17$ **20.** $(x + a)^2 + (y - b)^2 = c^2$

Write an equation of the circle that has the given center and radius.

21. $C(3, 0)$; $r = 8$ **22.** $C(0, 0)$; $r = 6$

23. $C(-4, -7)$; $r = 5$ **24.** $C(-2, 5)$; $r = \frac{1}{3}$

25. Sketch the graph of $(x - 3)^2 + (y + 4)^2 = 36$.

26. Sketch the graph of $(x - 2)^2 + (y - 5)^2 \leq 9$.

In Exercises 35–38 find an equation of the circle described and sketch the graph.

35. The circle has center (0, 6) and passes through point (6, 14).

36. The circle has center $(-2, -4)$ and passes through point (3, 8).

37. The circle has diameter $\overline{RS}$ where R is $(-3, 2)$ and S is (3, 2).

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CE#11-12

WE #17-26, 35-37