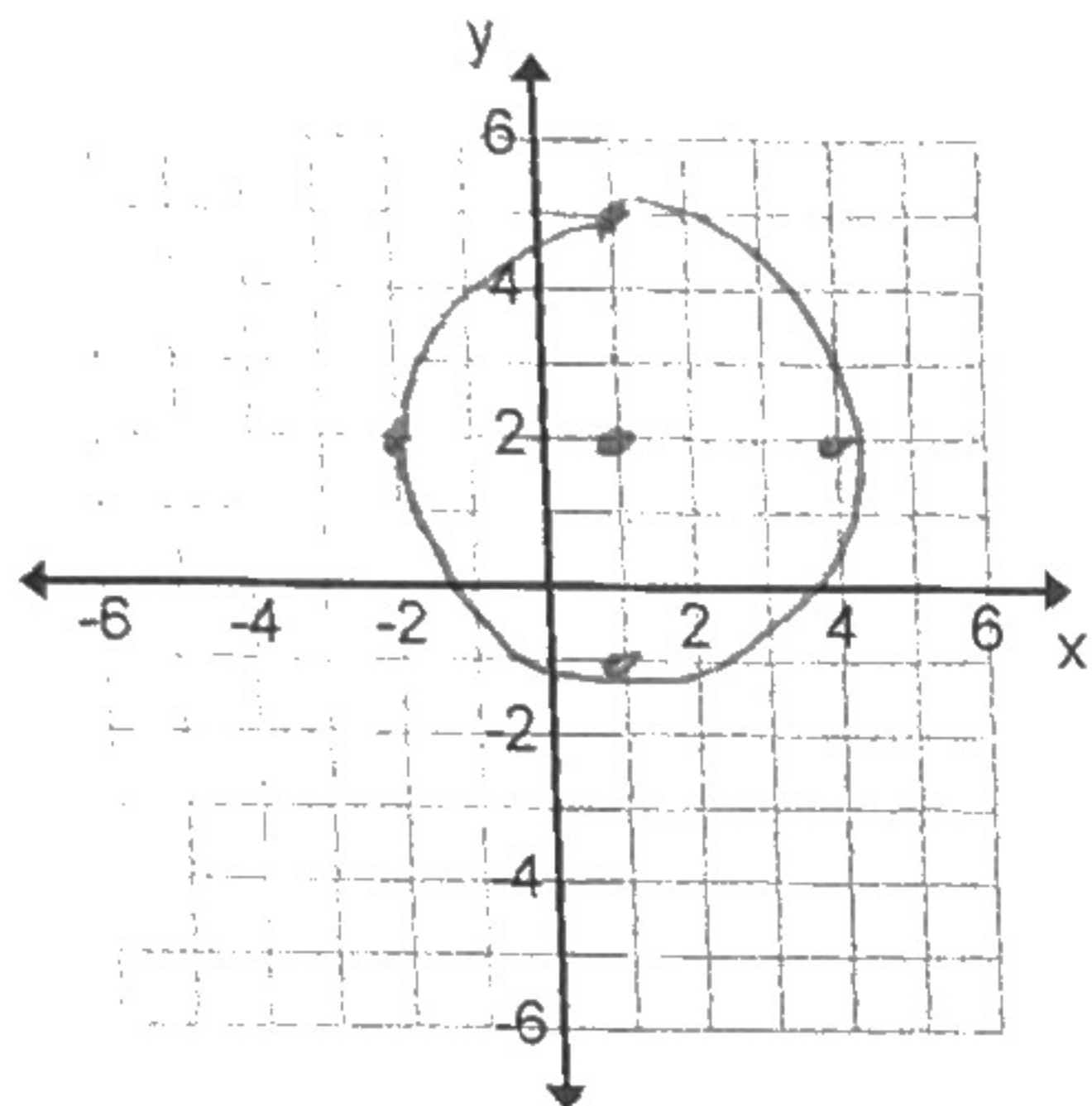


Determine the center and radius and then graph. Then rewrite the circle in the requested form.

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

Center: (1, -2) and  $r =$ 3

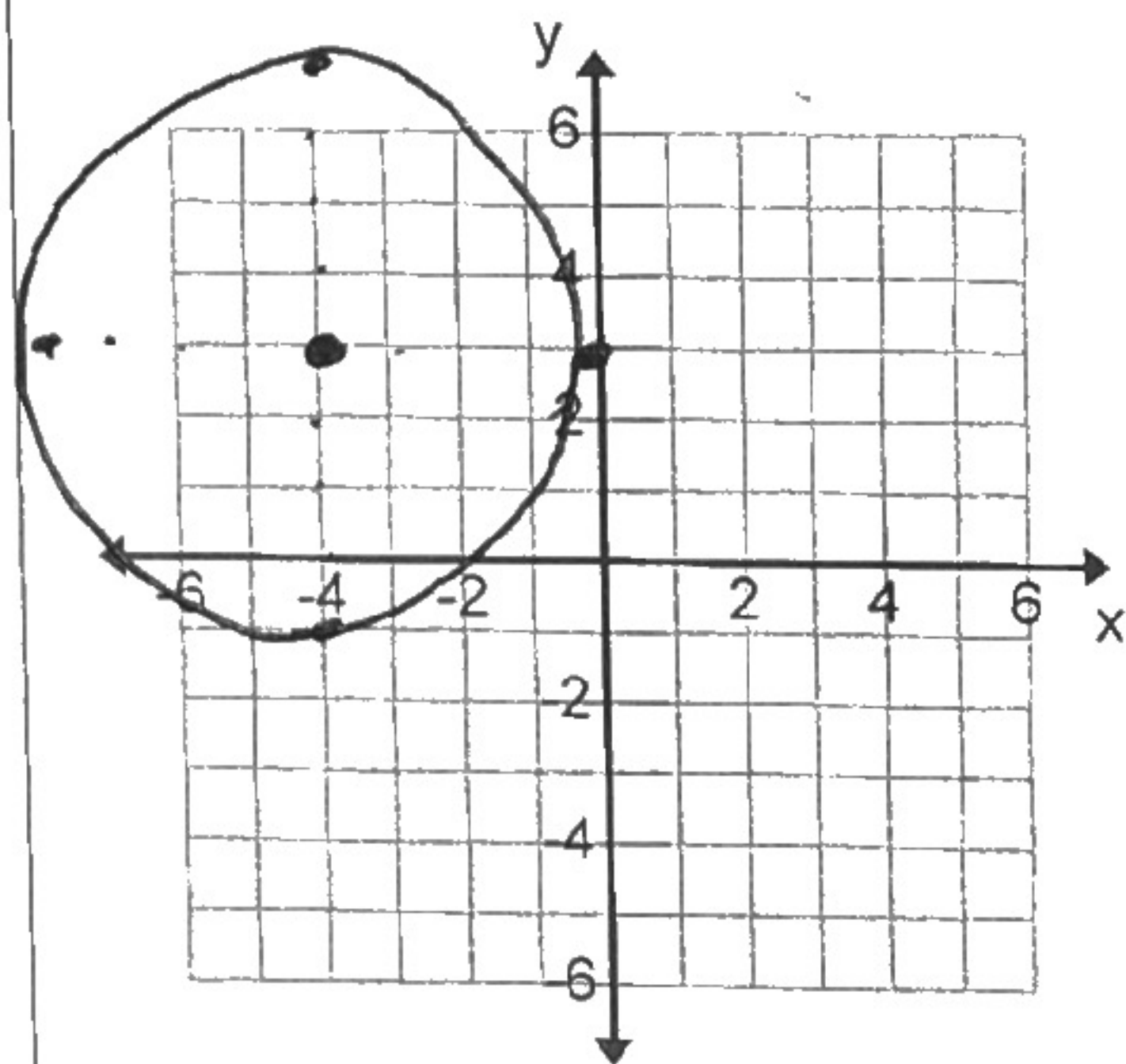


2.  $x^2 + y^2 + 8x - 6y = -9$

$$(x^2 + 8x + 4^2) + (y^2 - 6y + 3^2) = -9 + 16 + 9$$

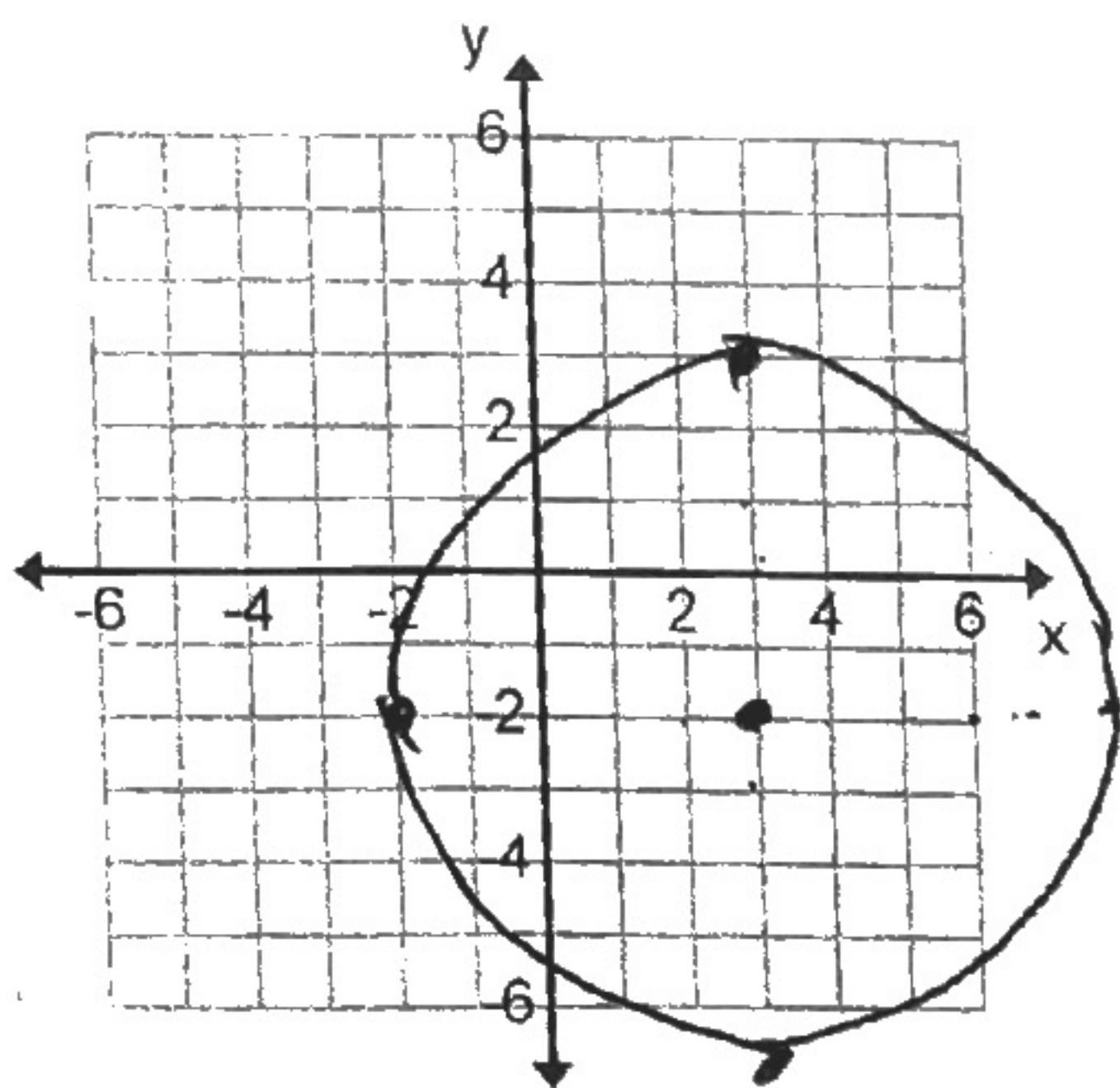
$$(x+4)^2 + (y-3)^2 = 16$$

Center: (-4, 3) and  $r =$ 4



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

Center: (3, -2) and  $r =$ 5



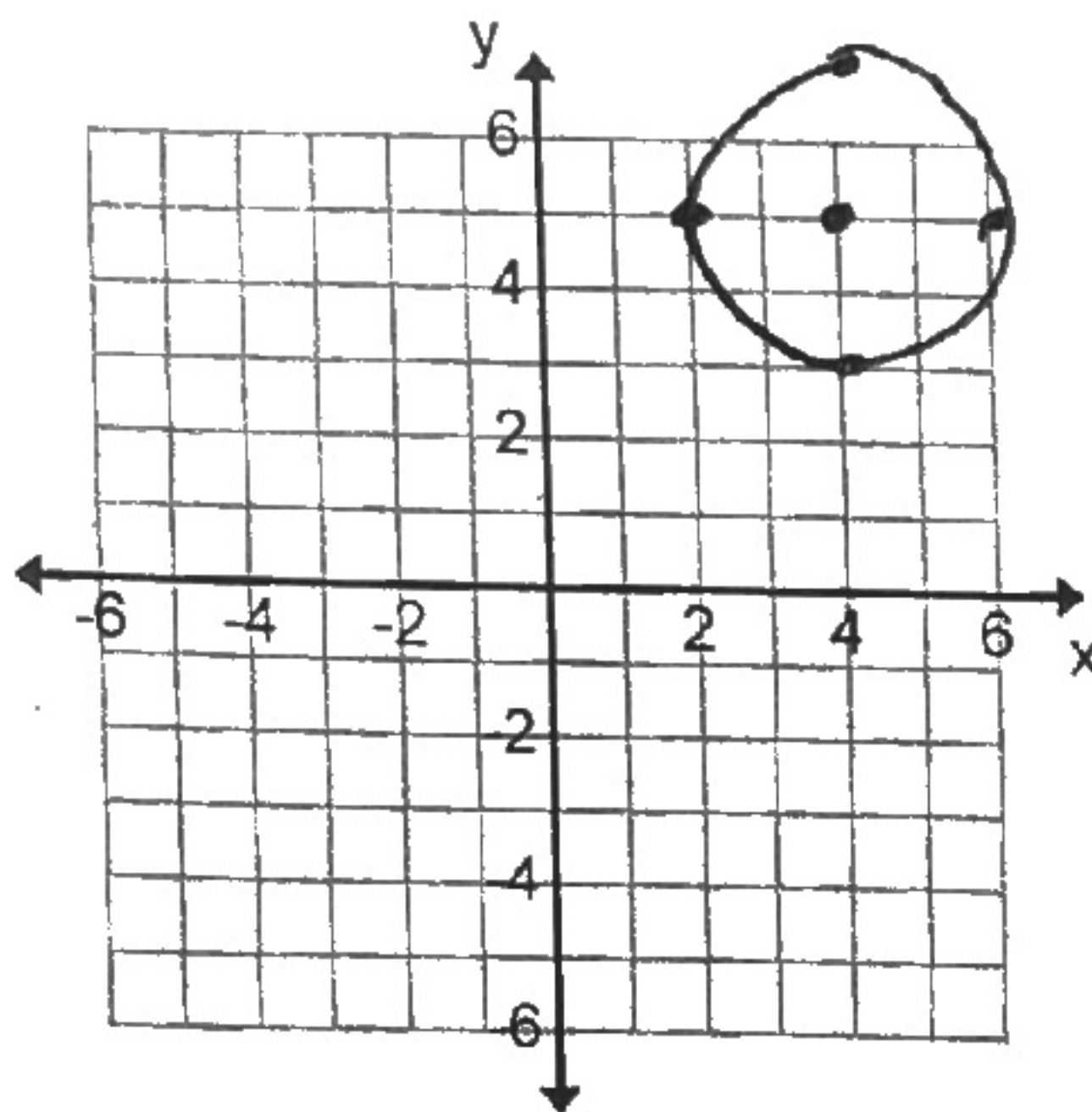
4.  $2x^2 + 2y^2 - 16x - 20y + 74 = 0$

$$x^2 + y^2 - 8x - 10y + 37 = 0$$

$$(x^2 - 8x + 4^2) + (y^2 - 10y + 5^2) = -37 + 16 + 25$$

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

Center: (4, 5) and  $r =$ 2





Write the equation of the circle in standard form.

5. Circle with center (2,5) and passing through (4,1).

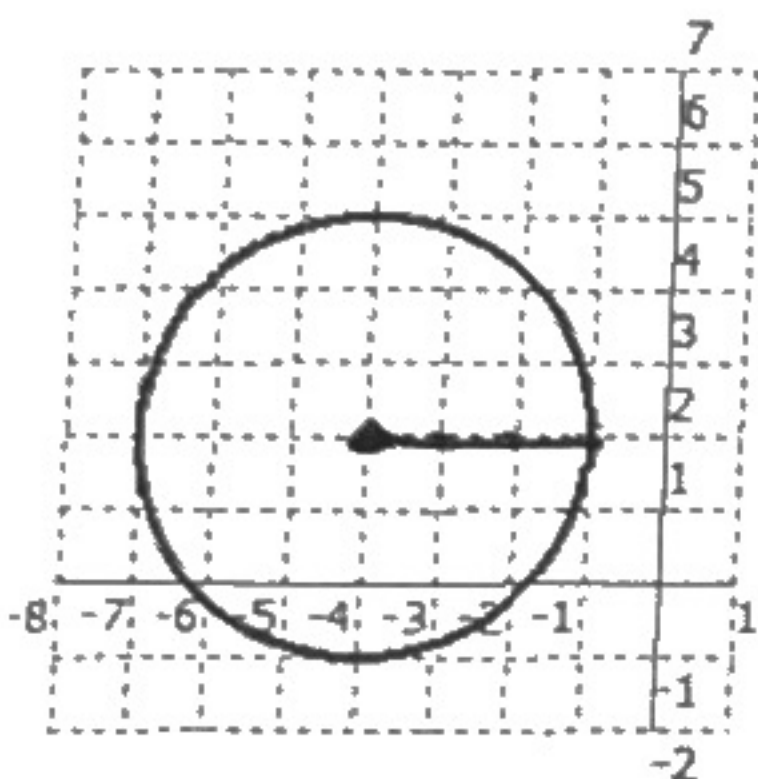
$$(x-2)^2 + (y-5)^2 = 20$$

6. Circle with center (-1,5) and passing through (7,-1).

$$\begin{aligned} (x+1)^2 + (y-5)^2 &= r^2 \\ (7+1)^2 + (-1-5)^2 &= r^2 \\ 64 + 36 &= r^2 \\ r &= 10 \end{aligned}$$

$$(x+1)^2 + (y-5)^2 = 100$$

7.

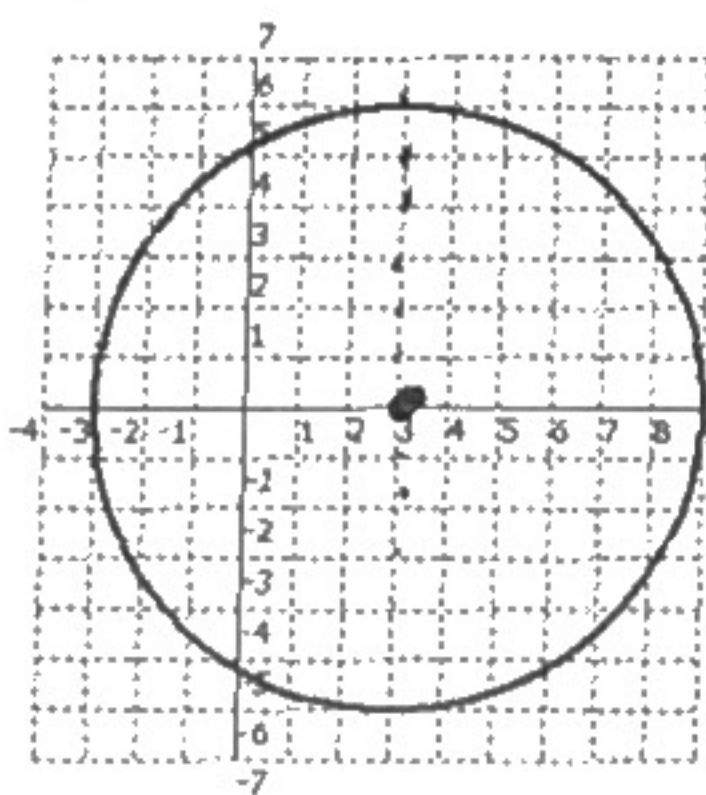


$$C: (-4, 2)$$

$$r = 3$$

$$(x+4)^2 + (y-2)^2 = 9$$

8.



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

9. Circle with center (-2,1) and tangent to the y-axis.

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

10. Circle with center (-3,-2) and tangent to the x-axis.

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

11. Congruent to the circle  $x^2 + y^2 = 9$  and translated 3 units down and 4 units right.

$$(x-4)^2 + (y-3)^2 = 9$$

12. Congruent to the circle  $(x-2)^2 + (y+1)^2 = 4$  and translated 3 units up and 2 units left.

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

Determine whether the graph of each of the following is a circle, a point circle, or no circle. Explain your answer.

13.  $2x^2 + 2y^2 = 5y - 4x - 2$

$$\begin{aligned} (x^2 + 2x + 1) + (y^2 - \frac{5}{2}y) &= -2 \\ (x+1)^2 + (y - \frac{5}{2})^2 &= 5.25 \end{aligned}$$

Circle

14.  $x^2 + y^2 - 4x - 6y + 13 = 0$

$$\begin{aligned} (x^2 - 4x + 4) + (y^2 - 6y + 9) &= -13 \\ (x-2)^2 + (y-3)^2 &= 0 \end{aligned}$$

Point

15.

$$3x^2 + 3y^2 - 30x + 18y + 178 = 0$$

$$\begin{aligned} (x^2 - 10x + 25) + (y^2 + 6y + 9) &= -\frac{178}{3} \\ (x-5)^2 + (y+3)^2 &= -25.3 \end{aligned}$$

NO Circle