

Mathematics Worksheet: Circles

Instructions:

- Answer all questions.
- Show full working where required.
- Write all equations in standard form: $(x - h)^2 + (y - k)^2 = r^2$.

Part A: Write the equation of the circle

Write the equation of the circle with the given center and radius.

1. Center $(3, -2)$, radius 5
2. Center $(-4, 1)$, radius 6
3. Center $(0, 0)$, radius 7
4. Center $(2, 5)$, radius 4
5. Center $(-1, -3)$, radius 9
6. Center $(6, -2)$, radius 3
7. Center $(0, -4)$, radius 10
8. Center $(-5, 2)$, radius 8

Part B: Identify the center and radius

Identify the center and the radius from each equation.

9. 1. $(x - 3)^2 + (y + 5)^2 = 16$
10. 2. $(x + 2)^2 + (y - 1)^2 = 9$
11. 3. $(x - 4)^2 + (y - 6)^2 = 25$
12. 4. $(x + 7)^2 + (y + 3)^2 = 49$
13. 5. $(x - 1)^2 + (y - 2)^2 = 36$
14. 6. $(x + 5)^2 + (y - 4)^2 = 64$
15. 7. $(x - 8)^2 + (y + 1)^2 = 100$

Part C: Find the center and radius (Complete the square)

Find the center and the radius of each circle. Show your steps.

16. 1. $x^2 - 8x + y^2 + 10y = 59$
17. 2. $x^2 + 6x + y^2 - 4y = 12$
18. 3. $x^2 - 2x + y^2 - 14y = 34$
19. 4. $x^2 + 10x + y^2 + 2y = 15$
20. 5. $x^2 - 12x + y^2 - 6y = 28$

Challenge Question

A circle has center $(-3, 4)$ and passes through the point $(2, 4)$.
Write the equation of the circle.