

Geometry · Equation of a Circle · Worksheet

Common Core G-GPE.A.1 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

These 25 problems practice standard G-GPE.A.1: writing the equation of a circle from its center and radius, reading the center and radius from an equation, completing the square, and deciding whether points are inside, on or outside a circle.

Problems get harder as you go. The last six use maps, towers and signals. Keep radicals exact unless told to round.

GeometryCommon Core: G-GPE.A.1

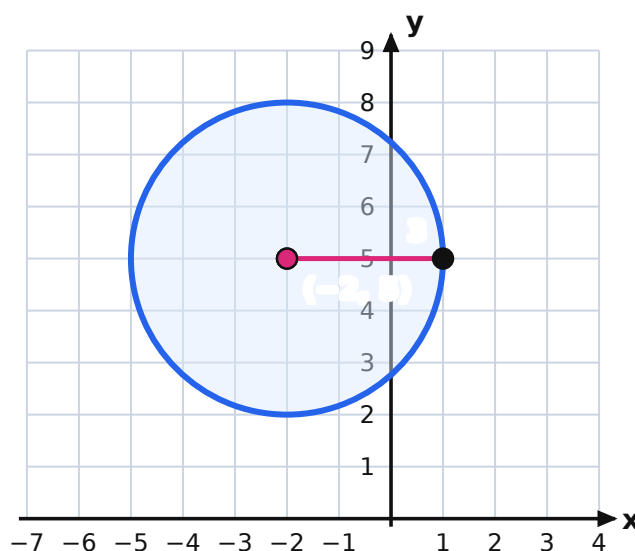
Problem 1: Center at the origin

Write the equation of the circle with center $(0,0)$ and radius 5.

Problem 2: Center and radius given

Write the equation of the circle with center $(3,2)$ and radius 4.

Problem 3: Negative x-coordinate



Circle with center $(-2, 5)$ and radius 3.

Write the equation of the circle with center $(-2,5)$ and radius 3, as drawn.

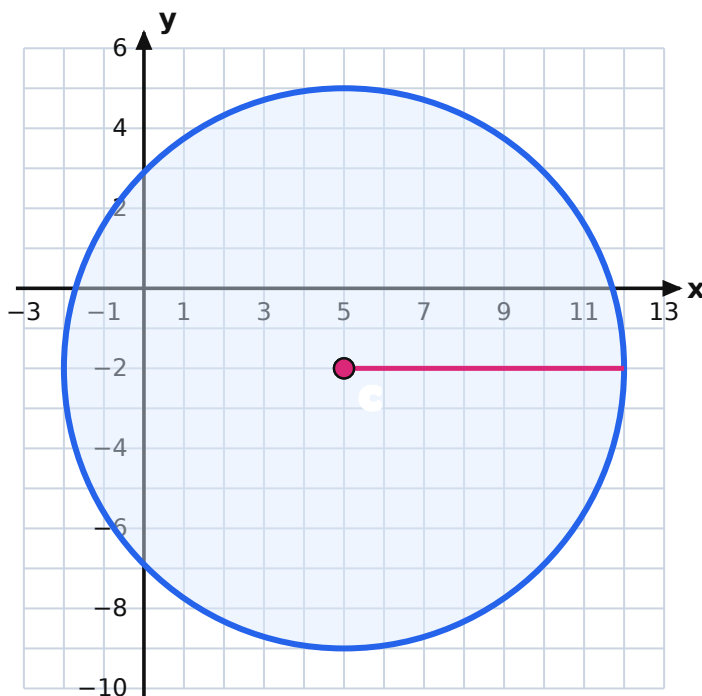
Problem 4: Radius is a square root

Write the equation of the circle with center $(4, -1)$ and radius $\sqrt{7}$.

Problem 5: Given the diameter length

A circle has center $(-6, -3)$ and a diameter of 20. Write its equation.

Problem 6: Read the center and radius



The circle $(x - 5)^2 + (y + 2)^2 = 49$.

Find the center and the radius of the circle $(x-5)^2 + (y+2)^2 = 49$.

Problem 7: Circle at the origin

Find the center and the radius of the circle $x^2 + y^2 = 36$.

Problem 8: Radius that is not a whole number

Find the center and the exact radius of the circle $(x+1)^2 + (y-4)^2 = 20$.

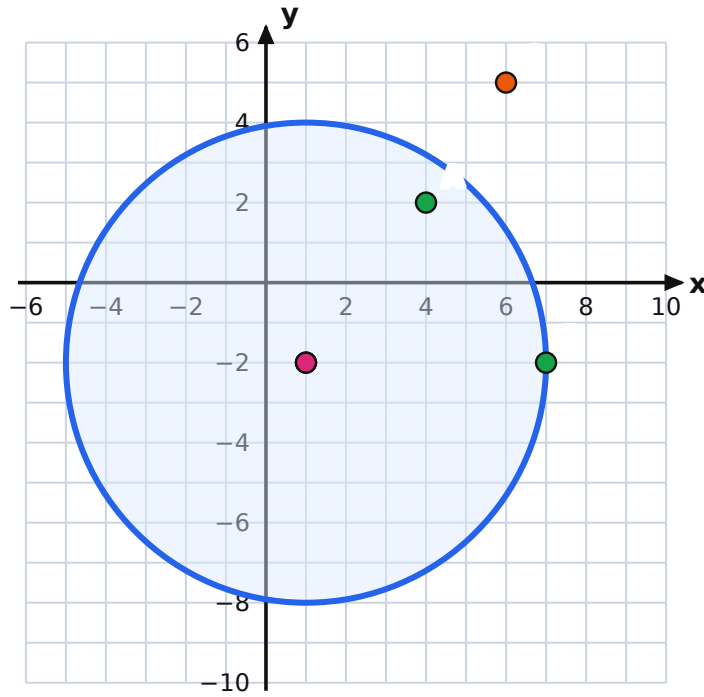
Problem 9: Unit circle shifted

Find the center and the radius of the circle $(x+8)^2 + (y+8)^2 = 1$.

Problem 10: Is the point on the circle?

Determine whether the point $(6,6)$ lies on the circle $(x-2)^2+(y-3)^2=25$.

Problem 11: Inside, on or outside



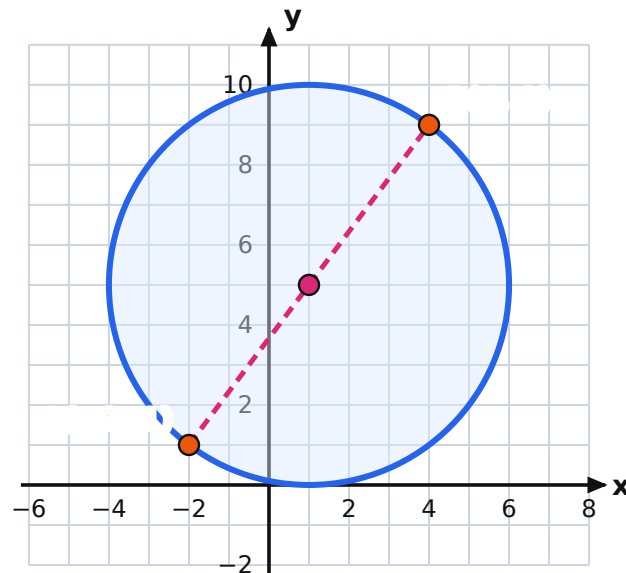
Circle with center $(1, -2)$ and radius 6.

The circle $(x-1)^2+(y+2)^2=36$ is shown. Classify each point as inside, on, or outside the circle: $A(4,2)$, $B(7,-2)$, $C(6,5)$.

Problem 12: Center and a point on the circle

A circle has center $(1,2)$ and passes through $(4,6)$. Write its equation.

Problem 13: Endpoints of a diameter



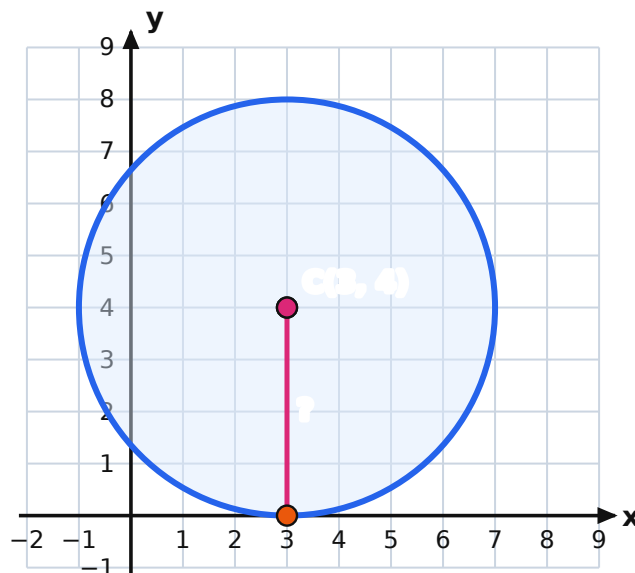
Segment AB is a diameter.

The endpoints of a diameter of a circle are $A(-2,1)$ and $B(4,9)$. Write the equation of the circle.

Problem 14: Find a missing coordinate

The point $(5,k)$ lies on the circle with center $(2,-3)$ and radius 5. Find both possible values of k .

Problem 15: Tangent to the x-axis



Circle with center $(3, 4)$ touching the x-axis.

A circle with center $(3,4)$ is tangent to the x-axis. Write its equation.

Problem 16: Tangent to the y-axis

A circle with center $(-5, 2)$ is tangent to the y-axis. Write its equation.

Problem 17: Complete the square, case 1

Rewrite $x^2 + y^2 + 8x - 2y + 8 = 0$ in standard form. Then state the center and the radius.

Problem 18: Complete the square, case 2

Rewrite $x^2 + y^2 - 10x - 4y + 4 = 0$ in standard form. Then state the center and the radius.

Problem 19: Complete the square, case 3

Rewrite $x^2 + y^2 + 2x + 6y - 15 = 0$ in standard form. Then state the center and the radius.

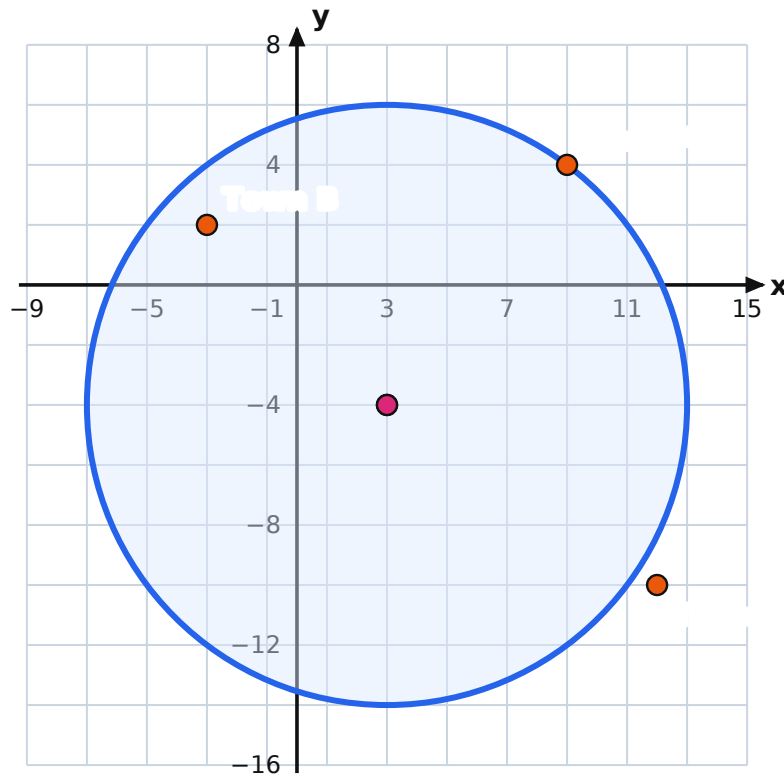
Problem 20: Only one variable shifted

Rewrite $x^2 + y^2 - 12y + 20 = 0$ in standard form. Then state the center and the radius.

Problem 21: Points with a given x-coordinate

Find the y-coordinates of the points on the circle $(x-2)^2 + (y+1)^2 = 100$ whose x-coordinate is 8.

Problem 22: Cell tower coverage



Map in miles with the tower at (3, -4).

On a map marked in miles, a cell tower stands at (3, -4) and its signal reaches 10 miles. Write an equation for the edge of the coverage area, then decide whether Town A at (9, 4), Town B at (-3, 2) and Town C at (12, -10) get a signal.

Problem 23: Wi-Fi router

A router sits at (2, 1), measured in feet from a corner of a gym, and its signal reaches 25 ft. Write the equation of the signal's boundary. Does a laptop at (20, 18) get a signal? Does a laptop at (20, 20)?

Problem 24: Pond on a map

A park map shows a circular pond with equation $x^2 + y^2 - 8x + 6y = 0$, in yards. Find the center and the radius of the pond. Is the origin, where the park entrance stands, on the edge of the pond?

Problem 25: Earthquake zone

An earthquake is felt up to 15 miles from its epicenter at (-6, 8) on a grid in miles. Write the equation of the boundary of the felt zone. Is the shaking felt at the point (6, -1) and at the origin?