

To the right is a circle graphed on a coordinate grid. Through the next series of questions, we will develop the **equation of circle** used to graph a circle on a coordinate grid.

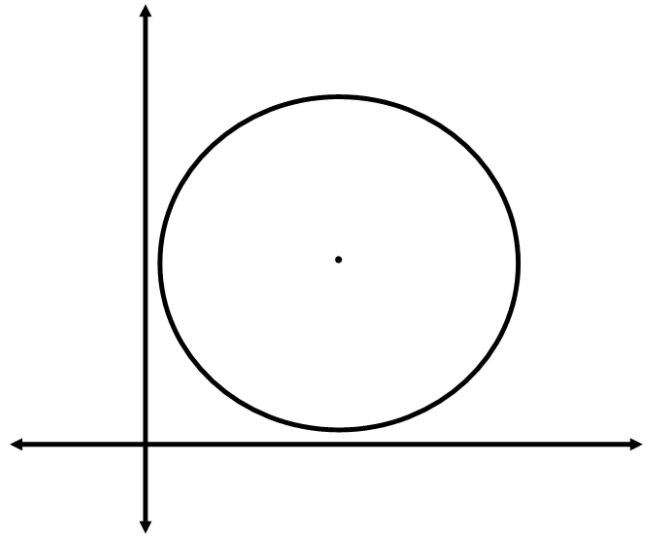
The definition of a **circle** is a set of points equidistant from a fixed point.

(1) The fixed point is called the _____ of the circle. In the figure to the right, label this point $C(h, k)$.

(2) Pick a point anywhere on the boundary of the circle and label it $P(x, y)$.

(3) The distance between the center and any point on the circle is called the _____. Draw a segment from the point C to point P and label it r .

(4) Use the Pythagorean Theorem to solve for r^2 .

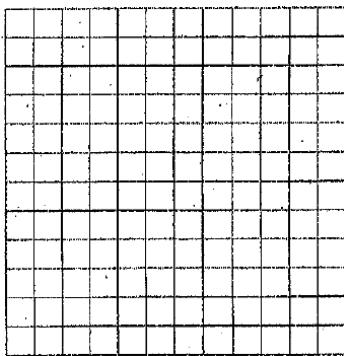


The equation in question 4 is the equation of a circle with center _____ and radius _____.

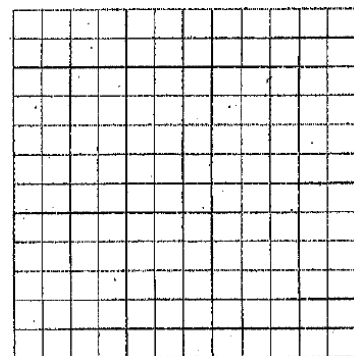
EXAMPLES

(A) Identify the center and radius of the circle and then graph on the coordinate grid provided.

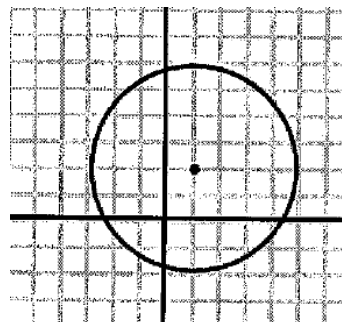
$$(x - 3)^2 + (y - 2)^2 = 9$$



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



(B) Determine the center and radius of the circle graphed to the right and write the equation.



(1) Match the equation of a circle with its description.

I. $x^2 + y^2 = 4$

II. $x^2 + y^2 = 9$

III. $(x + 1)^2 + (y - 4)^2 = 16$

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

V. $(x + 3)^2 + (y - 5)^2 = 16$

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

A. center: (-1, 4); radius: 4

B. center: (-2, -3); radius: 3

C. center: (0, 0); radius: 2

D. center: (2, 5); radius: 3

E. center: (-3, 5); radius: 4

F. center: (0, 0); radius: 3

(2) Write the equation of each circle described below.

(a) center: (2, 4); radius: 5

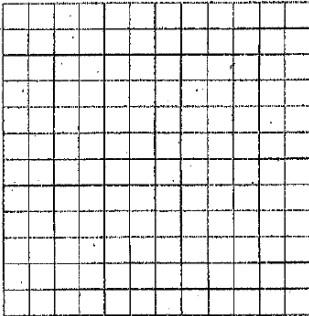
(b) center: (4, -1); radius: 6

(c) center: (0, 5); radius: 3.2

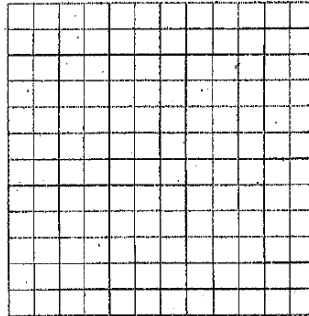
(d) center: (-9, 0); radius: 10

(3) Identify the center and radius of the circle and then graph on the coordinate grid provided.

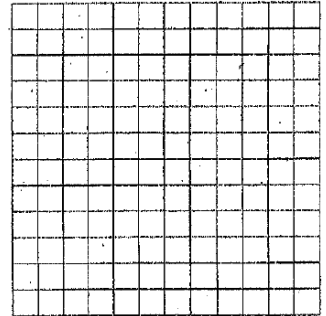
(a) $x^2 + y^2 = 25$



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



(c) $(x - 4)^2 + (y + 1)^2 = 16$



(4) Determine the equation of each circle graphed below.

