38. In the standard (x,y) coordinate plane, the center of the circle shown below lies on the x-axis at $x = 4$. If the circle is tangent to the y-axis, which of the following is an equation of the circle?
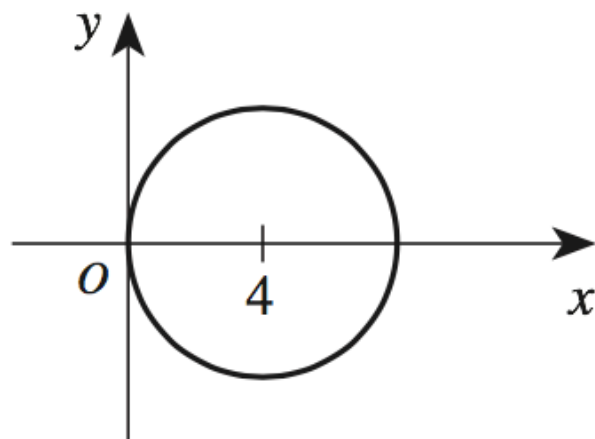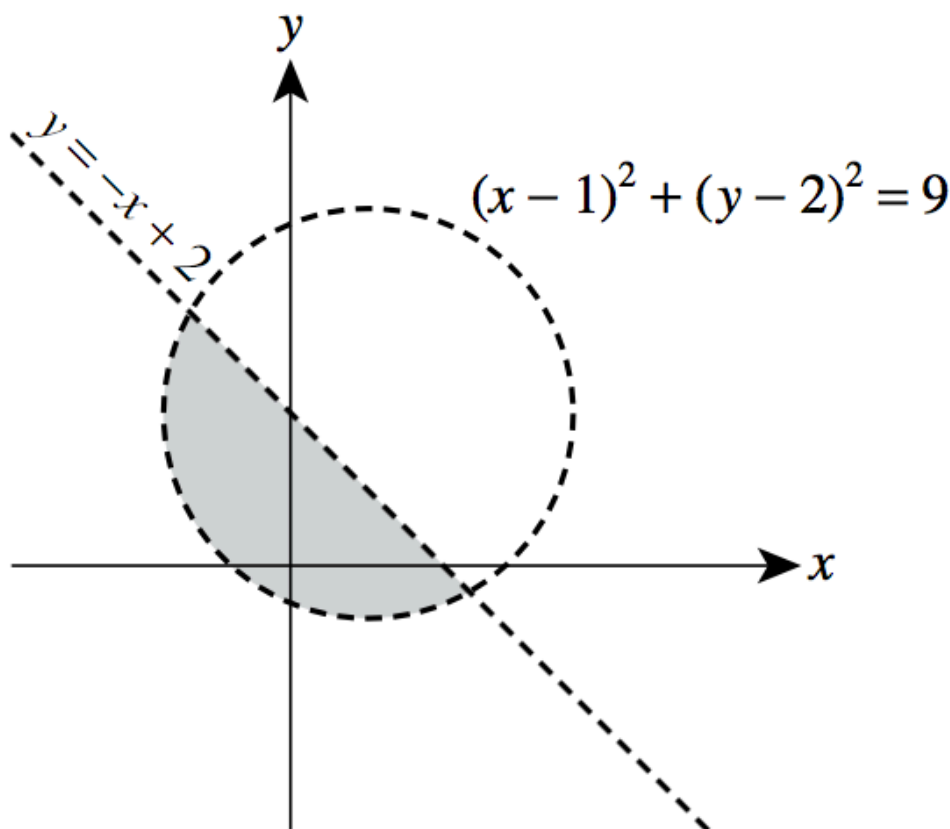
F. $(x + 4)^2 + y^2 = 4$

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

H. $(x - 4)^2 - y^2 = 16$

J. $(x - 4)^2 + y^2 = 4$

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

49. The shaded region in the graph below represents the solution set to which of the following systems of inequalities?

$y = -x + 2$

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

A. $\begin{cases} y < -x + 2 \\ (x-1)^2 + (y-2)^2 < 9 \end{cases}$

B. $\begin{cases} y > -x + 2 \\ (x-1)^2 + (y-2)^2 < 9 \end{cases}$

C. $\begin{cases} y > -x + 2 \\ (x-1)^2 + (y-2)^2 > 9 \end{cases}$

D. $\begin{cases} y < -x + 2 \\ (x-1)^2 + (y-2)^2 > 9 \end{cases}$

E. $\begin{cases} (y-2) < 3 \\ (x-1) > 3 \end{cases}$

37. As shown in the standard (x,y) coordinate plane below, $P(6,6)$ lies on the circle with center $(2,3)$ and radius 5 coordinate units. What are the coordinates of the image of P after the circle is rotated 90° clockwise (↻) about the center of the circle?
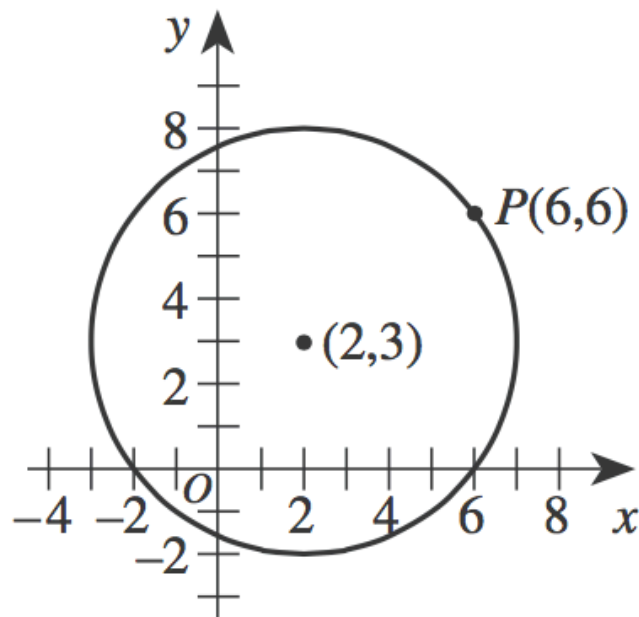
A. (2, 3)
B. (3, 2)
C. (5,−1)
D. (6, 0)
E. (7, 3)

The radio signal from the transmitter site of radio station WGGW can be received only within a radius of 52 miles in all directions from the transmitter site. A map of the region of coverage of the radio signal is shown below in the standard (x,y) coordinate plane, with the transmitter site at the origin and 1 coordinate unit representing 1 mile.
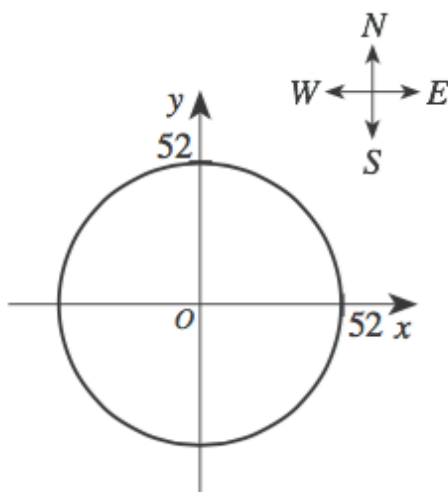
54. Which of the following is closest to the area, in square miles, of the region of coverage of the radio signal?

  F.   2,120
  G.   2,700
  H.   4,250
  J.   8,500
  K.   16,990

55. Which of the following is an equation of the circle shown on the map?

  A. $x + y = 52$
  B. $(x + y)^2 = 52$
  C. $(x + y)^2 = 52^2$
  D. $x^2 + y^2 = 52$
  E. $x^2 + y^2 = 52^2$

56. The transmitter site of radio station WGGW and the transmitter site of another radio station, WGWB, are on the same highway 100 miles apart. The radio signal from the transmitter site of WGWB can be received only within a radius of 60 miles in all directions from the WGWB transmitter site. For how many miles along the highway can the radio signals of *both* stations be received?

(Note: Assume the highway is straight.)

  F.   8
  G. 12
  H. 40
  J. 44
  K. 48

36. A particular circle in the standard (x,y) coordinate plane has an equation of $(x - 5)^2 + y^2 = 38$. What are the radius of the circle, in coordinate units, and the coordinates of the center of the circle?

	radius	center
F.	$\sqrt{38}$	(5,0)
G.	19	(5,0)
H.	38	(5,0)
J.	$\sqrt{38}$	(−5,0)
K.	19	(−5,0)

67. Find the radius of the circle with center $(4, -2)$ that is tangent to the y-axis.

a. 2

b. 6

c. 1

d. 4

e. 10

68. Find the area, in square units, of the circle represented by the equation $(x - 5)^2 + (y - 2)^2 = 36$.

    f. 6π

    g. 36π

    h. 25π

    i. -2π

    j. 4π

41. A circle in the standard (x,y) coordinate plane has center $(2,-3)$ and radius 4 units. Which of the following equations represents this circle?

A. $(x-2)^2 + (y+3)^2 = 4$
B. $(x+2)^2 - (y-3)^2 = 4$
C. $(x+2)^2 + (y-3)^2 = 4$
D. $(x-2)^2 + (y+3)^2 = 16$
E. $(x+2)^2 - (y-3)^2 = 16$

eliminate $r^2 = 16$

D

EQUATION OF CIRCLE

$(x-h)^2 + (y-k)^2 = r^2$

$(h,k) \Rightarrow$ CENTER COORDINATES

$r = $ radius

center $2, -3$ $r = 4$
$r^2 = 16$
$(x-2)^2 + (y-(-3)^2) = 4^2$
$\overset{22}{}$

GO ON TO THE NEXT PAGE.

56. The circle $(x-1)^2 + (y-2)^2 = 26$ intersects the y-axis in two points, one of which is $(0,7)$. At what other point does the circle intersect the y-axis?
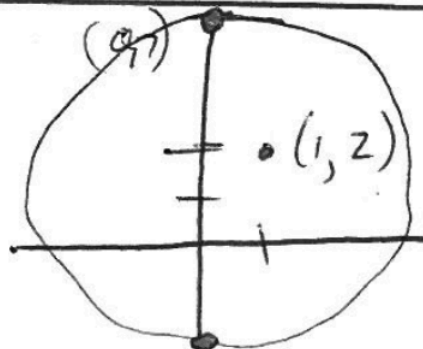
F. $(0,-7)$
G. $(0,-3)$
→ H. $(0,3)$
J. $(0,\sqrt{26})$
K. $(7,0)$

DRawing sketch will help

(9,7)

• $(1,2)$

(0,-3) closest

eliminate because all points that lie on y-Axis have 0 as x Value

ACT-53C

25

GO ON TO THE NEXT PAGE.

42. An equation of a particular circle is $(x - 3)^2 + y^2 = 10$. What are the coordinates of this circle's center and what is the length, in coordinate units, of this circle's radius?

	Center	Radius
F.	(−3,0)	$\sqrt{10}$
G.	(−3,0)	5
H.	(3,0)	$\sqrt{10}$
J.	(3,0)	5
K.	(3,0)	10

(handwritten annotations):

INTERpreting Equation
of circle formula

$Circle = (x-h)^2 + (y - k)^2 = r^2$ (h, k) Cent

$(x-3)^2 + y^2 = 10$

$(x-3)^2 + (y-0)^2 = (\sqrt{10})^2$

r = radi

Center (3, 0)

$r = \sqrt{10}$