1.2: Graphs of Equations and Circles

1. If the circle $(x - a)^2 + (y - b)^2 = 4, a < 0, b > 0$, is tangent to both axes, then $2a + 3b =$

   A) 2
   B) 4
   C) -2
   D) -4
   E) 6

2. The graph of the equation $xy^2 = |x^4 - y^2|$, is

   A) symmetric with respect to the x-axis only
   B) not symmetric with respect to the x-axis, y-axis, nor to the origin
   C) symmetric with respect to the x-axis and y-axis
   D) symmetric with respect to the y-axis only
   E) symmetric with respect to the origin only

3. If the graph of the circle $2x^2 + 2y^2 - 8x + 4y = 0$ has center (h, k) and radius r, then $h + k + r^2 =$

    A) 6

    B) 4

    C) $\sqrt{5} + 1$

    D) $\sqrt{5} - 1$

    E) 2

4. If the graph of the circle $(x + 2)^2 + (y - 3)^2 = k - 1$ is tangent to the y-axis, then $k =$

    A) 5

    B) 3

    C) 8

    D) 10

    E) 7

5. The equation $|x - y| = y^2 + 1$ is

A) symmetric with respect to the origin only

B) symmetric with respect to the x-axis only

C) symmetric with respect to the y-axis only

D) symmetric with respect to the x-axis, y-axis and origin

6. The equation of the circle having a diameter with endpoints $(-5,3)$ and $(1,5)$, is

A) $x^2 + y^2 + 4x - 8y + 10 = 0$

B) $x^2 + y^2 - 4x + 8y - 10 = 0$

C) $x^2 + y^2 - 4x + 8y + 10 = 0$

D) $x^2 + y^2 + 4x - 8y - 10 = 0$

E) $x^2 + y^2 - 4x - 8y - 10 = 0$

7. The center $C(h, k)$ and the radius r of the circle $1/2x^2 + 1/2y^2 - 3x + 2y - 3/2 = 0$ are

A) $C(3, -2)$, $r = 4$

B) $C(2, -3)$, $r = 4$

C) $C(3, -2)$, $r = \sqrt{15}$

D) $C(3, -2)$, $r = \sqrt{17}$

E) $C(3/2, -1)$, $r = \sqrt{2}/2$

8. The equation of the circle with center $(3, -1)$ and tangent to x-axis is

A) $x^2 + y^2 - 6x + 2y + 9 = 0$

B) $x^2 + y^2 - 6x + 2y = 0$

C) $x^2 + y^2 + 6x - 2y - 9 = 0$

D) $x^2 + y^2 - 6x + 2y + 1 = 0$

E) $x^2 + y^2 + 6x - 2y - 3 = 0$

9. If the center of the circle $x^2 + y^2 + 4x - 6y = 9$ is $(2a + 1, 2b - 1)$, then value of ab is equal to

A) -3

B) $-3/4$

C) $-2/3$

D) $-1/3$

E) $4/3$

10. The distance between the point $(-4, -4)$ and the center of the circle $x^2 + y^2 - 6x + 10y + 25 = 0$ is equal to

A) $5\sqrt{2}$

B) $4\sqrt{2}$

C) $3\sqrt{2}$

D) $2\sqrt{5}$

E) $10\sqrt{5}$

11. The graph of the equation $y^3 = -x^3y^2 + \dfrac{x}{|x|}$ is symmetry with respect to

A) the origin only

B) the y-axis and the origin

C) the x-axis and the origin

D) the x-axis only

E) the y-axis only.

12. The general equation of the circle with center at $C(3,2)$ and tangent to the x-axis is given by

A) $x^2 - 6x + y^2 - 4y + 9 = 0$

13.   If (h, k) is the center and r is the radius of the circle $2x^2 +$
   $2y^2 - 6x + 10y = 1$, then $h + k + r =$

   A) 2

14.   The distance between the center of the circle $(x - 3)^2 + (y +$
   $2)^2 = 36$ and the point $(-5,3)$ is:

   A) $\sqrt{89}$

15.   A circle in the second quadrant, tangent to both axes, and of diameter 1 has an equation:

A) $4\left(x + \frac{1}{2}\right)^2 + 4\left(y - \frac{1}{2}\right)^2 = 1$

16.   If $(4,6)$ is one end point of a diameter of a circle with center $(-3, 3/2)$, then the other end point of the diameter is:

A) $(-10, -3)$

17.   Which of the following statements is FALSE about the graph of

the equation: $(x - 3)^2 + (y - 2)^2 = m$

A) If $m = -9$ then the graph of the equation is nonexistent

B) If $m = 9$ then the graph of the equation is a circle that is
tangent to y-axis

C) If $m = 9$ then the graph of the equation is a circle that is
tangent to x-axis

D) If $m = 0$ then the graph of the equation is a point that is
above x-axis

E) If $m = 4$ then the graph of the equation is a circle with
radius 2

18.   The graph of the equation $|xy| + |x|y = 1$ is symmetric with

respect to

A) both the x - and y-axes

B) the x-axis only

C) the y-axis only

D) the origin only

E) both the x-axis and the origin.

19.   If $x^2 + y^2 + ax + by + c = 0$ is the equation of the circle whose center is in the second quadrant, radius 5 and tangent to both the x-axis and the y-axis, then $a + b + c =$

     A) 5

     B) 25

     C) 20

20.   If (h, k) is the center and r is the radius of the circle $2x^2 + 2y^2 - 8x + 20y + 26 = 0$, then $h + k + r =$

     A) -3

     B) 1

21.   If $x^2 + y^2 + 2x + dy + 1 = 0$ is the equation of the circle that

has center $(-1, a)$ in the second quadrant and tangent to both axes,

then $a + d =$

<mark>A)-1</mark>

22.   The product of the x-intercepts of the graph of the quation

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

<mark>A) -1</mark>

23.   For the circle, $3x^2 + 3y^2 + 18x + 24y + 27 = 0$, which one of
the following is TRUE?

A) The center is $(3,4)$ and the radius is 2.

B) The center is $(4,3)$ and the radius is 4.

C) The center is $(-3,-4)$ and the radius is 4.

24.   If $x^2 + y^2 + 2x + y - 1 = k$ represents an equation of a circle,
then the value(s) of k is (are)

A) $\left(-\frac{9}{4}, \infty\right)$

B) $\left(-\infty, -\frac{9}{4}\right)$
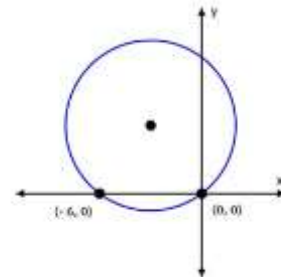
C) $-\frac{9}{4}$

D) $(-\infty, -4)$

E) $-\frac{11}{4}$

25.   The graph of the equation $|y| = (x - y)^2$ is

A) symmetric with respect to the origin only

B) symmetric with respect to the x-axis only

C) symmetric with respect to the y-axis only

D) symmetric with respect to the x-axis and y-axis

E) not symmetric with respect to the x-axis, y-axis and origin

26.   An equation of the circle centered at $(-3,4)$ in the graph below, is

(-6, 0)   (0, 0)

A) $x^2 + y^2 + 6x - 8y = 0$

B) $x^2 + y^2 - 6x + 8y = 0$

C) $x^2 + y^2 + 6x - 8y - 25 = 0$

D) $x^2 + y^2 - 6x + 8y - 25 = 0$

E) $x^2 + y^2 + 6x - 8y + 25 = 0$

27. In the adjacent figure, the lines SQ and PR are the horizontal and vertical diameters of the circle $(x - 3)^2 + (y + 2)^2 = 16$. If the point $M(a, b)$ is the midpoint of the line segment PQ, then $a + b =$

A) 5

B) 3

C) 7

D) 10

E) $4\sqrt{2}$