

## 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  $y^3 = -x^3y^2 + \frac{x}{|x|}$  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  $a + d =$

A)-1

22. The product of the  $x$ -intercepts of the graph of the equation  $(x - 1)^2 + y^2 = 2$  is

A) -1

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

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

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

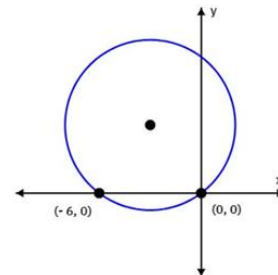
B) symmetric with respect to the  $x$ -axis only

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



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