MATHS

BOOKS - NDA PREVIOUS YEARS

CIRCLE

Mcqs

1. An equilateral triangle is inscribed in the circle $x^2 + y^2 = a^2$ with one of the vertices at (a,0). What is the equation of the side opposite to this vertex ?

A. $2x - a = 0$

B. $x + a = 0$

C. $2x + a = 0$

D. $3x - 2a = 0$

Answer: C

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2. If a circle passes through the points (0,0), (a,0)and(0,b), then find the coordinates of its centre.

A. $\sqrt{a^2 - b^2}$

B. $\sqrt{a^2 + b^2}$

C. $\dfrac{1}{2}\sqrt{a^2 + b^2}$

D. $2\sqrt{a^2 + b^2}$

Answer: C

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3. it two circles, A, B of equal radii pass through the

centres of each other, then what is the ratio of the

length of the smaller arc to the circumference of

the circle A but off by the circle

A. $\dfrac{1}{2}$

B. $\dfrac{1}{4}$

C. $\dfrac{1}{3}$

D. $\dfrac{2}{3}$

Answer: C

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4. If the extremities of a diameter of a circle are $(0, 0)$ and $(a^3, 1/a^3)$ then the circle passes through which one of the following points ?

A. $\left(a^2, 1/a^2\right)$

B. $(a, 1/a)$

C. $(a, -a)$

D. $(1/a, a)$

Answer: D

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5. What is the length of the intercept made on the x-axis by the circle $x^2 + y^2 + 2gx + 2fy + c = 0$?

A. $\dfrac{\sqrt{(g^2 - c)}}{2}$

B. $\dfrac{\sqrt{(g^2 - 4c)}}{2}$

C. $2\sqrt{(g^2 - 4c)}$

D. $2\sqrt{(g^2 - c)}$

Answer: D

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6. Under which one of the following conditions does the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ meet the x-axis in two points on opposite sides of the origin?

A. $c > 0$

B. $c < 0$

C. $c = 0$

D. $c \leq 0$

Answer: B

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7. What is the equation of a circle whose center lies on the x-axis at a distance h from the origin and the circle passes through the origin ?

A. $x^2 + y^2 - 2hx = 0$

B. $x^2 + y^2 - 2hx + h^2 = 0$

C. $x^2 + y^2 + 2hxy = 0$

D. $x^2 + y^2 - h^2 = 0$

Answer: A

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8. Consider a circle of radius R. What is the lengths of a chord which subtends an angle θ at the centre ?

A. $2R \sin\left(\dfrac{\theta}{2}\right)$

B. $2R\sin\theta$

C. $2R\tan\left(\dfrac{\theta}{2}\right)$

D. $2R\tan\theta$

Answer: A

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9. What is the equation of circle which touches the

lines $x = 0$, y = 0 and $x = 2$?

A. $x^2 + y^2 + 2x + 2r + 1 = 0$

B. $x^2 + y^2 - 4x - 4y + 1 = 0$

C. $x^2 + y^2 - 2x - 2y + 1 = 0$

D. None of these

Answer: C

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10. Equation of a circle passing through origin is $x^2 + y^2 - 6x + 2y = 0$. What is the equation of one of its diameter ?
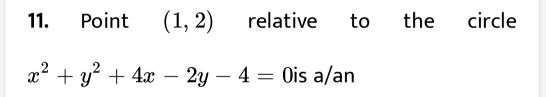
A. $x + 3y = 0$

B. $x + y = 0$

C. $x = y$

D. $3x + y = 0$

Answer: A

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11. Point $(1, 2)$ relative to the circle $x^2 + y^2 + 4x - 2y - 4 = 0$ is a/an

A. exterior point

B. interior point, but not centre

C. boundary point

D. centre

Answer: A

12. If the circle

$x^2 + y^2 + 2gx + 2fy + x = 0 (c > 0)$ touches the

y-axis then which one of the following is correct ?

A. $g = -\sqrt{c}$ only

B. $g = \pm\sqrt{c}$

C. $f = \sqrt{c}$ only

D. $f = \pm \sqrt{c}$

Answer: D

13. The equation of the circle which touches the axes at a distances 5 from the origin is

$$y^2 + x^2 - 2\alpha x - 2\alpha y + \alpha^2 = 0$$

What is the value of α ?

A. 4

B. 5

C. 6

D. 7

Answer: B

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14. AB is an equilateral triangle inscribed in a circle of centre O and radius $5cm$. Let the diameter through C meet the circle again at D.

Assertion (A) : $AD.\,BD < OB.\,OC$

Reason (R) : $2\big(AD^2 + BD^2\big) = CD^2 = 100 sqcm$

A. Both A and R are individually true and R is the correct explanation of A

B. Both A and R are individually true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: D

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15. If x-axis is tangent to the circle $x^2 + y^2 + 2gx + fy + k = 0$. Then which one of the following is correct ?

A. $g^2 = k$

B. $g^2 = f$

C. $f^2 = k$

D. $f^2 = g$

Answer: A

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16. The circle $x^2 + y^2 + 4x - 4y - 4 = 0$ touches

A. Only the x-axis

B. Only the y-axis

C. Both the axes

D. Neither of the axes

Answer: C

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17. Consider the following statement in respect of circles $x^2 + y^2 - 2x - 2y = 0$ and $x^2 + y^2 = 1$

1. The radius of the first circle is twice that of the second circle.

2. Both the circles pass through the origin.

Which of the statements given above is/are correct ?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: D

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18. What is the equation to circle which touchs both the axes and has centre on the line $x + y = 4$?

A. $x^2 + y^2 - 4x + 4y + 4 = 0$

B. $x^2 + y^2 - 4x - 4y + 4 = 0$

C. $x^2 + y^2 + 4x - 4y - 4 = 0$

D. $x^2 + y^2 + 4x + 4y - 4 = 0$

Answer: B

19. For the equation

$$ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0 \qquad \text{where}$$

$a \neq 0$, to represent a circle, the condition will be

    A. $h = g, a = b$

    B. $h = g = f, a = b$

    C. $h = 0, a = b$

    D. $h = 0, g^2 + f^2 - c = a + b$

Answer: C

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20. For the equation

$$ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0 \qquad \text{where}$$

$a \neq 0$, to represent a circle, the condition will be

    A. $a = b$ and $c = 0$

    B. $f = g$ and $h = 0$

    C. $a = b$ and $h = 0$

    D. $f = g$ and $c = 0$

Answer: C

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21. What is the radius of the circle touching x-axis at $(3, 0)$ and y-axis at $(0, 3)$?

A. 3 units

B. 4 units

C. 5 units

D. 6 units

Answer: A

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22. Which one of the following points lies inside a circle of radius 6 and centre at $(3, 5)$?

A. $(-2, -1)$

B. $(0, 1)$

C. $(-1, -2)$

D. $(2, -1)$

Answer: B

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23. The radius of the circle $x^2 + y^2 + x + c = 0$ passing through the origin is

A. $\dfrac{1}{4}$

B. $\dfrac{1}{2}$

C. 1

D. 2

Answer: B

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24. What is the distance between the centres of the two circles ?

A. $\sqrt{a^2 + b^2}$

B. $a^2 + b^2$

C. $a + b$

D. $2(a + b)$

Answer: A

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25. The two circles touch each other if

A. $c = \sqrt{a^2 + b^2}$

B. $\dfrac{1}{c} = \dfrac{1}{a^2} + \dfrac{1}{b^2}$

C. $c = \dfrac{1}{a^2} + \dfrac{1}{b^2}$

D. $c = \dfrac{1}{a^2 + b^2}$

Answer: B

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26. A straight line $x = y + 2$ touches the circle $4\left(x^2 + y^2\right) = r^2$, The value of r is:

A. $\sqrt{2}$

B. $2\sqrt{2}$

C. 2

D. 1

Answer: B

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27. If the centre of the circle passing through the origin is $(3, 4)$.

then the intercept cut off by the circle on x-axis and y-axis respectively are

A. 3 unit and 4 unit

B. 6 unit and 4 unit

C. 3 unit and 8 unit

D. 6 unit and 8 unit

Answer: D

28. If a circle of radius b units with centre at $(0, b)$ touches the line $y = x - \sqrt{2}$, then what is the value of b ?

A. $2 + \sqrt{2}$

B. $2 - \sqrt{2}$

C. $2\sqrt{2}$

D. $\sqrt{2}$

Answer: A

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29. Consider the two circles $(x - 1)^2 + (y - 3)^2 = r^2$ and $x^2 + y^2 - 8x + 2yy + 8 = 0$

What is the distance between the centres of the two circles ?

A. 5 units

B. 6 units

C. 8 units

D. 10 units

Answer: A

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30. If two circles $(x - 1)^2 + (y - 3)^2 = r^2$ and $x^2 + y^2 - 8x + 2y + 8 = 0$ intersect in two distinct points, then

A. $r = 1$

B. $1 < r < 2$

C. $r = 2$

D. $2 < r < 8$

Answer: D

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31. Consider a circle of passing through the origin and the points (a, b) and $(-b, -a)$

What is the sum of the squares of the intercepts cut off by the circles on the axes ?

A. $x + y = 0$

B. $x - y = 0$

C. $x + y = a + b$

D. $x - y = a^2 - b^2$

Answer: A

32. Consider a circle of passing through the origin and the points (a, b) and $(-b, -a)$

What is the sum of the squares of the intercepts cut off by the circle on the axes ?

A. $\left(\dfrac{a^2 + b^2}{a^2 - b^2}\right)^2$

B. $2\left(\dfrac{a^2 + b^2}{a - b}\right)^2$

C. $4\left(\dfrac{a^2 - b^2}{a - b}\right)^2$

D. None of these

Answer: B

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33. Find the equation of the circle passing through the point $(2, 4)$ and having its centre at the intersection of the lines $x - y = 4$ and $2x + 3y + 7 = 0$.

   A. 3 unit

   B. 5 units

   C. $3\sqrt{3}$ units

   D. $5\sqrt{2}$ units

Answer: D

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34. The two circles $x^2 + y^2 = r^2$ and $x^2 + y^2 - 10x + 16 = 0$ intersect at two distinct points. Then

A. $2 < r < 8$

B. $r = 2$ or $r = 8$

C. $r < 2$

D. $r > 2$

Answer: A

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35. What is the equation of the circle which passes through the points (3,-2) and (-2, 0) and having its centre on the line 2x-y-3=0?

A. $x^2 + y^2 + 3x + 2 = 0$

B. $x^2 + y^2 + 3x + 12y + 2 = 0$

C. $x^2 + y^2 + 2x = 0$

D. $x^2 + y^2 = 5$

Answer: B

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36. The equation the circle which passes through the points $(1, 0)$, $(0, -6)$ and $(3, 4)$ is

A. $4x^2 + 4y^2 + 142x + 47y + 140 = 0$

B. $4x^2 + 4y^2 - 142x - 47y + 138 = 0$

C. $4x^2 + 4y^2 - 142x + 47y + 138 = 0$

D. $4x^2 + 4y^2 + 150x - 49y + 138 = 0$

Answer: C

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37. The equation of a circle whose end the points of a diameter are (x_1, y_1) and (x_2, y_2) is

A.
$$(x - x_1)(x - x_2) + (y - y_1)(y - y_2) = x^2 + y^2$$

B. $(x - x_1)^2 + (y - y_1)^2 = x_2 y_2$

C. $x^2 + y^2 + 2x_1 x_2 + 2y_1 y_2 = 0$

D. $(x - x_1)(x - x_2) + (y + y_1)(y - y_2) = 0$

Answer: D

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38. If y-axis touches the cirle.

$x^2 + y^2 + gx + fy + \dfrac{c}{4} = 0$ then the normal at

this point intersects the circle at the point.

39. A circle is drawn on the chord of a circle

$x^2 + y^2 = a^2$ as diameter. The chord lies on the

line $x + y = a$. What is the equation of the circle ?

A. $\left(-\dfrac{g}{2}, \ -\dfrac{f}{2} \right)$

B. $\left(-g, \ -\dfrac{f}{2} \right)$

C. $\left(-\dfrac{g}{2}, \ f \right)$

D. $(- g, - f)$

Answer: B

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40. The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on y-axis equal to

A. 1

B. 4

C. 3

D. 7

Answer: A

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