MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

CIRCLE

Solved Examples

1. Find the equation of circle with centre (3, - 2) and radius 5.

A. $x^2 + y^2 - 6x + 4y - 12 = 0$

B. $x^2 + y^2 - 4x + 6y - 10 = 0$

C. $x^2 + y^2 + 6x - y - 10 = 0$

D. none of these

Answer: A

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2. Find the equation of a circle whose centre is $(2, -1)$ and which passes through the point $(3, 6)$.

A. $\Rightarrow x^2 + y^2 + 4x - 2y - 45 = 0$

B. $\Rightarrow x^2 + y^2 - 4x + 2y - 45 = 0$

C. $\Rightarrow x^2 + y^2 - 4x - 2y - 45 = 0$

D. None of these

Answer: B

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3. 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 $2x + 3y + 7 = 0$.

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4. Find the equation of the circle with radius 5 whose centre lies on xaxis and passes through the point (2, 3).

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5. Find the equation of a circle, the end points of one of whose diameters are $A(2, -3)$ and $B(-3, 5)$.

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6. Find the equations of the circles drawn on the diagonals of the rectangle as its diameter whose sides are $x = 6, x = -3, y = 3 \, and \, y = -1.$

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7. If $y = 2x$ is a chord of the circle $x^2 + y^2 - 10x = 0$, find the equation of a circle with this chord as diameter.

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8. Find the equation of a circle with centre (h, k) and touching the x -axis.

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9. Find the equatiion of a circle with centre (h, k) and touching the y-axis.

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10. Find the equation of a circle with centre (h, k) and touching both the axes

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11. Show that the equaion $x^2 + y^2 - 6x + 4y - 36 = 0$ represents a circle. Also, find its centre and radius.

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12. Show that the equation $3x^2 + 3y^2 + 12x - 18y - 11 = 0$represent a circle. Also find its centre and radius .

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13. Find the equation of a circle passing through the points $(5, 7), (6, 6)$ and $(2, -2)$. Find its centre and radius.

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14. The radius of the circle passing through the vertices of the triangle formed by the lines $x + y = 2, 3x - 4y = 6, x - y = 0$

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15. Show that the points $(5, 5), (6, 4), (-2, 4)$ and $(7, 1)$ are concyclic, i.e., all lie on the same circle. Find the equation, centre and radius of this circle.

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16. Find the equation of the circle passing through the centre of the circle $x^2 + y^2 + 8x + 10y - 7 = 0$ and concentric with the circle $x^2 + y^2 - 4x - 6y = 0$.

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17. Find the equation of the circle whose centre lies on the line $x - 4y = 1$ and which passes through the points $(3, 7)$ and $(5, 5)$.

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18. Find the equation of a circle concentric with the circle

$2x^2 + 2y^2 - 6x + 8y + 1 = 0$

and of double its area.

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19. Find the equation of a circle which passes through the origin and cuts off intercepts -2 and 3 from the x - axis and the y - axis respectively.

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Exercise 21 A

1. find the equation of circle whose centre $(2, 4)$ and radius 5

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2. find the equation of circle whose centre $(-3, -2)$ and radius 6

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3. centre (a, a) and radius $\sqrt{2}$

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4. Find the equation of the circle with: Centre $(a\cos\alpha,\ a\ s \in \alpha)$ and radius a.

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5. Find the equation of the circle with centre : $(-a, b)$and radius $\sqrt{a^2 - b^2}$.

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6. centre at the origin and radius 4

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7. Find the centre and radius of each of the following circles :

(i) $(x-3)^2+(y-1)^2=9$

(ii) $\left(x-\frac{1}{2}\right)^2+\left(y+\frac{1}{3}\right)^2=\frac{1}{16}$

(iii) $(x+5)^2+(y-3)^2=20$

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

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8. Find the equation of the circle whose centre is $(2, -5)$ and which passes through the point $(3, 2)$

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9. Find the equation of the circle of radius 5 cm, whose centre lies on the lies on the y-axis and which passes through the point $(3, 2)$

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10. Find the equation of th circle whose centre is $(2, -3)$ and which passes through the intersection of the lines $3x + 2y = 11$ and $2x + 3y = 4$.

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11. Find the equation of the circle passing through the point $(-1, 3)$ and having its centre at the point of intersection of the lines $x - 2y = 4$ and $2x + 5y + 1 = 0$

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12. If two diameters of a circle lie along the lines $x - y = 9$ and $x - 2y = 7$, and the area of the circle is 38.5 sq cm, find the equation of the circle.

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13. Find the equation of the circle, the coordinates of the end points of one of whose diameters are

(i) $A(3, 2)$ and $B(2, 5)$

(ii) $A(5, -3)$ and $B(2, -4)$

(iii) $A(-2, -3)$ and $B(-3, 5)$

(iv) $A(p, q), B(r, s)$

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14. The sides of a rectangle are given by the equations x=-2, x = 4, y=-2 andy=5. Find the equation of the circle drawn on the diagonal of this rectangle as its diameter.

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Exercise 21 B

1. Find the centre and radius of each of the following circle: $x^2 + y^2 - 4x + 6y = 5$

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2. Show that the equation $x^2 + y^2 + x - y = 0$ represents a circle find its centre and radius.

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3. Show that the equation $3x^2 + 3y^2 + 6x - 4y - 1 = 0$ represents a circle Find its centre and radius.

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4. Show that the equation $x^2 + y^2 + 2x + 10y + 26 = 0$ represents a point circle. Also, find its centre.

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5. Show that the equation $x^2 + y^2 - 3x + 3y + 10 = 0$ does not represent a circle.

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6. Find the equation of the circle passing through the points

(i) $(0, 0), (5, 0)$ and $(3, 3)$

(ii) $(1, 2), (3, -4)$ and $(5, -6)$

(iii) $(20, 3), (19, 8)$ and $(2, -9)$

Also, find the centre and radius in each case.

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7. Find the equation of the circle which is circumscribed about the triangle whose vertices are $A(-2, 3), B(5, 2)$ and $C(6, -1)$. Find the centre and radius of this circle.

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8. Find the equation of the circle concentric with the circle $x^2 + y^2 + 4x + 6y + 11 = 0$ and passing through the point $P(5, 4)$.

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9. Show that the points $A(1, 0), B(2, -7), C(8, 1)$ and $D(9, -6)$ all lie on the same circle. Find the equation of this circle, its centre and radius.

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10. Find the equation of the circle which passes through the points $(1, 3)$ and $(2, -1)$, and has its centre on the line $2x + y - 4 = 0$

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11. Find the equation of the circle concentric with the circle $x^2 + y^2 - 4x - 6y - 3 = 0$ and which touches the y axis

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12. The equation of circle concentric with circle $x^2 + y^2 - 6x + 12y + 15 = 0$ and double its area is

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13. Prove that the centres of the three circles $x^2 + y^2 - 4x - 6y - 12 = 0$, $x^2 + y^2 + 2x + 4y - 5 = 0$ and $x^2 + y^2 - 10x$

are collinear.

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14. Find the equation of the circles which passes through the points $A(1, 1)$ and $B(2, 2)$ and whose radius is 1. Show that there are two such circles.

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15. Find the equation of the circle passing through (0, 0) and making intercepts a and b on the coordinate axes.

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16. Find the equation of the circle circumscribing the triangle formed by the straight lines $x + y = 6, 2x + y = 4$ and $x + 2y = 5$.

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17. Show that the quadrilateral formed by the straight lines $x - y = 0, 3x + 2y = 5, x - y = 10$ and $2x + 3y = 0$ is cyclic and hence find the equation of the circle.

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18. If $(-1, 3)$ and (α, β) are the extremities of the diameter of the circle $x^2 + y^2 - 6x + 5y - 7 = 0$, find the coordinates (α, β).

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