MATHS

BOOKS - SAI MATHS (TELUGU ENGLISH)

SYSTEM OF CIRCLE

Problems

1. The equation of the circle passing through (1,2) and the point of intersection of the circles

$x^2 + y^2 - 8x - 6y + 21 = 0$ and $x^2 + y^2 - 2x - 15 = 0$ is

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

B. $x^2 + y^2 + 6x - 2y + 9 = 0$

C. $x^2 + y^2 - 6x - 4y + 9 = 0$

D. $x^2 + y^2 - 6x + 4y + 9 = 0$

Answer: C

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2. The lengthk of the equation chord of the two circles $(X - a)^2 + y^2 = a^2$ and $x^2 + (y - b)^2 = b^2$ is

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

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

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

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

Answer: B

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3. The locus of centres of the circles which cut the circles $x^2 + y^2 + 4x - 6y + 9 =$ and $x^2 + y^2 - 5x + 4y + 2 = 0$ orthogonally is

A. 3x + 4y - 5 = 0

B. 9x - 10y + 7 = 0

C. 9x + 10y - 7 = 0

D. 9x - 10y + 11 = 0

Answer: B

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4. If $x^2 + y^2 - 4x - 2y + 5 = 0$ and $x^{2+y^2-6x-4y=0}$ are membes of a coaxal system of circles then centre of a point circle in the systems is

A. (-5, -6)

B. (5, 6)

C. (3,5)

D. (-8,-13)

Answer: A

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5. The point at which the circles $x^2 + y^2 - 4x - 4y + 7 = 0$ and $x^2 + y^2 - 12x - 10y + 45 = 0$ touch each other is

A. $\left(\frac{13}{5}, \frac{14}{5}\right)$

B. $\left(\frac{2}{5}, \frac{5}{6}\right)$

C. $\left(\frac{14}{5}, \left(\frac{13}{5}\right)\right)$

D. $\left(\frac{12}{5}, 2+\frac{\sqrt{21}}{5}\right)$

Answer: C

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6. The length of the common chord of the two circles $x^2+y^2-4y=0$ and $x^2+y^2-8x-4y+11=0$ is

A. $\frac{\sqrt{145}}{4}cm$

B. $\frac{\sqrt{11}}{2}cm$

C. $\sqrt{135}cm$

D. $\frac{\sqrt{135}}{4}cm$

Answer: D

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7. The locus of the centre of the circle, which cuts the circle $x^2 + y^2 - 20x + 4 = 0$ orthogonally and touchs the line x = 2 , is

A. $x^2 = 16y$

B. $y^2 = 4x$

C. $y^2 = 16x$

D. $x^2 = 4y$

Answer: C

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8. (a,0) and (b,0) are centres of two circles belonging to a coaxial system of which y-axis is the radical axis. If radius of one of the circle is r then the radius of the other circles is

A. $\left(r^2 + b^2 + a^2\right)^{1/2}$

B. $\left(r^2+b^2-a^2\right)^{1/2}$

C. $\left(r^2+b^2-a^2\right)^{1/3}$

D. $\left(r^2+b^2+a^2\right)^{10}$

Answer: C

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9. If the circle $x^2+y^2+4x-6y+c=0$ bisects the circumference of the circle $x^2+y^2-6x+4y-12=0$, then c is equal to

A. 16

B. 24

C. -42

D. -62

Answer: D

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10. A circle passes through the points (3,4) and cuts the circle $x^2 + y^2 = a^2$ orthogonally, the locus of its centre is a straight line. If the distance of this straight line from the origin is 25, then a^2 is equal to

A. 250

B. 225

C. 100

D. 25

Answer: B

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11. The equation to the line joining the centres of the circles belonging to the coaxial system of circles $4x^2 + 4y^2 - 12x + 6y - 3 + \lambda(x + 2y - 6) = 0$ is

A. 8x -4y - 15 = 0

B. 8x - 4y + 15 = 0

C. 3x - 4y - 5 = 0

D. 3x - 4y + 5 = 0

Answer: A

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12. If the circle $x^2 + y^2 + 8x - 4y + c = 0$ touches the circle $x^2 + y^2 + 2x + 4y - 11 = 0$ externally and cuts the circle $x^2 + y^2 - 6x + 8y + k = 0$ orthogonally then k =

A. 59

B. -59

C. 19

D. -19

Answer: B

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13. The point of contact of the circle $x^2 + y^2 + 2x + 2y + 1 = 0$ and $x^2 + y^2 - 2x + 2y + 1 = 0$

A. (0,1)

B. (0,-1)

C. (1,0)

D. (-1,0)

Answer: B

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14. The equation of the radical axis of the pair of circles $7x^2 + 7y^2 - 7x + 14y + 18 = 0$ and $4x^2 + 4y^2 - 7x + 8y + 20 = 0$ is :

A. x - 2y - 5 = 0

B. 2x - y + 5 = 0

C. 21x - 68 = 0

D. 23x - 68 = 0

Answer: C

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15. If the lengths of tangents drawn to the circles

$x^2 + y^2 - 8x + 40 = 0$

$5x^2 + 5y^2 - 25x + 80 = 0$

$x^2 + y^2 - 8x + 16y + 160 = 0$

From the point P are equal, then P is equal to

A. $\left(8, \frac{15}{2}\right)$

B. $\left(-8, \frac{15}{2}\right)$

C. $\left(8, \frac{-15}{2}\right)$

D. $\left(-8, \frac{-15}{2}\right)$

Answer: C

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16. If the circle $x^2 + y^2 + 2x + 3y + 1 = 0$ cuts another circle $x^2 + y^2 + 4x + 3y + 2 = 0$ in A and B, then the equation of the

circle with AB as a diamter is

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

B. $2x^2 + 2y^2 + 2x + 6y + 1 = 0$

C. $x^2 + y^2 + x + 6y + 1 = 0$

D. $2x^2 + 2y^2 + x + 3y + 1 = 0$

Answer: B

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17. The point (3,-4) lies on both the circles $x^2 + y^2 - 2x + 8y + 13 = 0$ and $x^2 + y^2 - 4x + 6y + 11 = 0$.

Then the angle between the circles is :

A. 60°

B. $\tan^{-1}\left(\frac{1}{2}\right)$

C. $\tan^{-1}\left(\frac{3}{5}\right)$

D. 135°

Answer: D

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18. The equation of the circle which passes the origin and cuts orthogonally each of the circles $x^2 + y^2 - 6x + 8 = 0$ and $x^2 + y^2 - 2x - 2y = 7$ is

A. $3x^2 + 3y^2 = 8x - 13y = 0$

B. $3x^2 + 3y^2 - 8x + 29y = 0$

C. $3x^2 + 3y^2 + 8x + 29y = 0$

D. $3x^2 + 3y^2 - 8x - 29y = 0$

Answer: B

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19. The condition for the coaxial system $x^2 + y^2 + 2\lambda x + c = 0$, where λ is parameter and c is a constant , to have distinct limiting points is

A. c = 0

B. c lt 0

C. C = -1

D. C gt 0

Answer: D

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20. The equation of the circle whose diameter is the common chord of the circles

$x^2 + y^2 + 2x + 3y + 2 = 0$ and

$x^2 + y^2 + 2x - 3y - 4 = 0$ is

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

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

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

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

Answer: C

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21. If the circle $x^2 + y^2 + 6x - 2y + k = 0$ bisects the circumference of the circle $x^2 + y^2 + 2x - 6y - 15 = 0$, then k =

A. 21

B. -21

C. 23

D. -23

Answer: D

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22. The limiting points of the coxail system containing the two circules

$x^2 + y^2 + 2x - 2y + 2 = 0$ and

$(25(x^2 + y^2) - 10x - 80y + 65 = 0$ are

A. (1, -1), (3, -40)

B. (1,-1) $\left(-\frac{1}{5}, \frac{8}{5}\right)$

C. (-1,1), $\left(\frac{1}{5}, \frac{8}{5}\right)$

D. $\left(-\frac{1}{5}, \frac{8}{5}\right)$

Answer: C

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23. The radical axis of circles

$x^2 + y^2 + 5x + 4y - 5 = 0$ and

$x^2 + y^2 - 3x + 5y - 6 = 0$ is

A. 8y - x + 1 = 0

B. 8x - y + 1 = 0

C. 8x - 8y + 1 = 0

D. y - 8x + 1 = 0

Answer: B

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24. If the polar of a point on the circle $x^2 + y^2 = p^2$ with respect to the circle $x^2 + y^2 = q^2$ touches the circle $x^2 + y^2 = r^2$ then p,q r are in

A. AP

B. GP

C. HP

D. AGP

Answer: B

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