MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

Pair Of Lines

Question Bank

1. A value of p for which the equation $x^2 + pxy + y^2 - 5x - 7y + 6 = 0$ represents a pair of lines is

A. $\frac{5}{2}$

B. 5

C. 2

D. $\frac{2}{5}$

Answer: A

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2. The value of k for which $y^2 + xy + kx^2 - x - 2y + k = 0$ represents two lines is

A. 2

B. $\frac{1}{3}$

C. $\frac{1}{4}$

D. $\frac{1}{2}$

Answer: C

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3. The distance between the pair of parallel lines $8x^2 + 8xy + 2y^2 + 26x + 13y + 15 = 0$ is

A. $\frac{7}{\sqrt{5}}$

B. $\frac{7}{2\sqrt{5}}$

C. $\frac{\sqrt{7}}{5}$

D. $\frac{\sqrt{5}}{7}$

Answer: B

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4. The equation to the pair of lines through the origin and perpendicular to $5x^2 - y^2 = 0$ is

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

B. $x^2 - 5y^2 = 0$

C. $x^2 + 5y^2 = 0$

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

Answer: B

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5. If one of the lines $ax^2 + 2hxy + by^2 = 0$ bisects the angle between the aaxes in the first quadrant then

A. $h^2 - ab = 0$

B. $h^2 + ab = 0$

C. $(a+b)^2 = h^2$

D. $(a+b)^2 = 4h^2$

Answer: D

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6. The condition that the slope of one the lines of $ax^2 + 2hxy + by^2 = 0$ is twice the other is

A. $h^2 = ab$

B. $2h^2 = 3ab$

C. $8h^2 = 9ab$

D. $h^2 = 9ab$

Answer: C

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7. The slope of one of the lines $2x^2 + 3xy + \lambda y^2 = 0$ is $2,$ then the angle between the lines is

A. $\frac{\pi}{3}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{6}$

D. $\frac{\pi}{2}$

Answer: D

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8. If the pair of lines $xy - x - y + 1 = 0$ and the line $ax + 2y - 3 = 0$ are concurrent then $a =$

A. -1

B. 0

C. 3

D. 1

Answer: D

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9. The equation $ax^2 + by^2 + cx + cy = 0, c \neq 0$ represents a pair of lines, if

A. $a + b = 0$

B. $b + c = 0$

C. $a + c = 0$

D. $a + b + c = 0$

Answer: A

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10. If $x^2 - kxy - y^2 + 2y + 2 = 0$ represents a pair of lines than the value of k is

A. $\sqrt{2}$

B. 2

C. $2\sqrt{2}$

D. none of these

Answer: D

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11. The equation to the pair of lines passing through (1,-1) and parallel to the pair of lines $x^2 - 7xy + 12y^2 = 0$ is

A. $(x - 3y - 4)(x - 4y - 5) = 0$

B. $(x - 3y - 4)(x + 4y - 5) = 0$

C. $(x + 3y - 4)(x - 3y - 5) = 0$

D. $(x + 3y - 4)(x - 4y + 5) = 0$

Answer: A

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12. The equation

$9x^2 + 24xy + b^2y^2 - 12x + 16y - 12 = 0$

represents a pair of parallel lines then $b =$

A. ±2

B. ±3

C. ±4

D. ±5

Answer: C

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13. Distance between the pair of lines represented by the equation $x^2 - 6xy + 9y^2 + 3x - 9y - 4 = 0$ is

A. $\frac{15}{\sqrt{10}}$

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

C. $\sqrt{\frac{5}{2}}$

D. $\frac{1}{\sqrt{10}}$

Answer: C

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14. The join of (-3,2) and (4,6) is cut by x -axis in the ratio

A. 2: 3 internally

B. 1: 2 externally

C. 1: 3 externally

D. 3: 2 internally

Answer: C

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15. The sum of the slopes of the lines represented by $4x^2 + 2hxy - 7y^2 = 0$ is equal to the product of the slopes then h is

A. -4

B. 4

C. -6

D. -2

Answer: D

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16. If one of the pair of lines represented by $ax^2 + 2hxy + by^2 = 0$ is $y = mx$, then

A. $a + 2hm + bm^2 = 0$

B. $b + 2hm + am^2 = 0$

C. $h + 2am + bm^2 = 0$

D. $h + 2hm + am^2 = 0$

Answer: A

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17. If one of the pair of lines represented by $6x^2 + 2hxy - 3y^2 = 0$ is $y = 3x$, then $h =$

A. $\frac{5}{2}$

B. $\frac{7}{2}$

C. 6

D. 7

Answer: B

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18. The angle between the pari of lines represented by $x^2 - 7xy + 12y^2 = 0$ is :

A. $\frac{\sin^{-1}(1)}{12}$

B. $\frac{\sin^{-1}(1)}{13}$

C. $\frac{\sin^{-1}(1)}{\sqrt{170}}$

D. $\frac{\sin^{-1}(1)}{\sqrt{85}}$

Answer: C

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19. The distance between the parallel lines given by

$(x + 7y)^2 + 4\sqrt{2}(x + 7y) - 42 = 0$ is

A. 2

B. 7

C. $4\sqrt{2}$

D. $8\sqrt{2}$

Answer: A

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20. If the slope of one of the lines represented by $ax^2 - 6xy + y^2 = 0$ is the square of the other then

A. $a = 1$

B. $a = 4$

C. $a = 6$

D. $a = 8$

Answer: D

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21. If the pair of lines $ax^2 + 2hxy - ay^2 = 0$ and $bx^2 + 2gxy - by^2 = 0$ be such that each bisects the angle between the other then

A. $ab + gh = 0$

B. $h^2 - ab = 0$

C. $ah + bg = 0$

D. $ag + bh = 0$

Answer: A

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22. If the pairs of lines

$3x^2 - 2pxy - 3y^2 = 0$ and $5x^2 - 2qxy - 5y^2 = 0$

are such that each pair bisects the angle between the other pair then pq equals

A. 1

B. -7

C. -9

D. -15

Answer: D

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23. The equation x-y=4 and $x^2 + 4xy + y^2 = 0$ represent the sides of

A. an isosceles triangle

B. an equilateral triangle

C. a angled triangle

D. none of these

Answer: B

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24. If $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a parallel lines, then

A. $hf = bg$

B. $h^2 = bc$

C. $a^2 f = b^2 g$

D. none of these

Answer: A

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25. If $x^2 - kxy - y^2 + 2y + 2 = 0$ represents a pair of lines than the value of k is

A. 2

B. $\frac{1}{\sqrt{2}}$

C. $2\sqrt{2}$

D. $\sqrt{2}$

Answer: D

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26. If the pair of lines $ax^2 + 2hxy + by^2 = 0$ is rotated about the origin through 90^0, then their equation in the new position is given by

A. $ax^2 - 2hxy - by^2 = 0$

B. $ax^2 - 2hxy + by^2 = 0$

C. $bx^2 + 2hxy + ay^2 = 0$

D. $bx^2 - 2hxy + ay^2 = 0$

Answer: D

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27. Area of triangle formed by :

$2x^2 + xy - 3y^2 = 0$ and x+y=3 is

A. $\frac{49}{4}$

B. $\frac{41}{4}$

C. $\frac{43}{4}$

D. $\frac{43}{4}$

Answer: D

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28. The equation of the pair of lines through the origin, the sum and the product of whose slopes are respectively the arithmetic and geometrical mean of 9 and 16 is

A. $24x^2 - 25xy + 2y^2 = 0$

B. $24x^2 + 25xy + 2y^2 = 0$

C. $24x^2 - 25xy - 2y^2 = 0$

D. $2x^2 + 25xy - 24y^2 = 0$

Answer: A

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29. Centroid of the triangle formed by the sides y-1 =0 and $x^2 + 7xy + 2y^2 = 0$ is

A. $\left(-\frac{7}{3}, \frac{2}{3}\right)$

B. $\left(\frac{7}{3}, \frac{2}{3}\right)$

C. $\left(\frac{2}{3}, 0\right)$

D. $\left(-\frac{2}{3}, 0\right)$

Answer: A

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30. Orthocentre of the triangle formed by the lines

$x + y + 1 = 0$ and

$2x^2 - xy - y^2 + x + 2y - 1 = 0$ is

A. (0,1)

B. (-1,0)

C. (-1,1)

D. (1,1)

Answer: B

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31. The angle between the pair of straight lines

$y^2 \sin^2\theta - xy\sin^2\theta + x^2(\cos^2\theta - 1) = 0$ is

A. $\frac{\pi}{3}$

B. $\frac{\pi}{4}$

C. $\frac{2\pi}{3}$

D. $\frac{\pi}{2}$

Answer: D

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32. The equation of pair of lines joining origin to the points of intersection of $x^2 + y^2 = 9$ and $x + y = 3$ is

A. $4x^2 - 9xy + 4y^2 = 0$

B. $2x^2 - 7xy - 2y^2 = 0$

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

D. $2x^2 + 7xy - 2y^2 = 0$

Answer: C

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33. The equation of second degree $x^2 + 2\sqrt{2}xy + 2y^2 + 4x + 4\sqrt{2}y + 1 = 0$ represents a pair of parallel lines, then the distance between them is

A. 4

B. $4\sqrt{3}$

C. 2

D. $2\sqrt{3}$

Answer: C

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34. If the angle between two st lines represented by $2x^2 + 5xy + 3y^2 + 7y + 4 = 0$ is $\tan^{-1}$ m then m equals

A. $\frac{1}{5}$

B. 1

C. $\frac{1}{5}$

D. 7

Answer: A

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35. If the lines joining the origin to the points of intersection of the line y =mx +2 and the curve $x^2 + y^2 = 1$ are right angles then

A. 0

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

C. 1

D. -1

Answer: B

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36. A diagonal of the rectangle formed by the lines $x^2 - 7x + 6 = 0$ and $y^2 - 14y + 40 = 0$ is

A. $5x - 6y = 0$

B. $5x + 6y = 0$

C. $6x - 5y - 14 = 0$

D. $6x - 5y + 14 = 0$

Answer: D

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37. The equation of the pair of lines passing through (0,1) and parallel to $2x^2 + 5xy + 3y^2 + 6x + 7y + 4 = 0$ is

A. $2x^2 + 5xy + 3y^2 - 5x - 6y + 3 = 0$

B. $2x^2 + 5xy + 3y^2 + 5x - 6y + 3 = 0$

C. $2x^2 + 5xy + 3y^2 - 5x + 6y + 3 = 0$

D. $2x^2 + 5xy + 3y^2 + 5x + 6y + 3 = 0$

Answer: A

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38. If $4xy + 2x + 2fy + 3 = 0$ represents a pair of lines, then $f =$

A. 2

B. 3

C. 5

D. 6

Answer: B

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39. The equation of the pair of lines passing through the origin and each is at a distance of 2 units from (1,1) is

A. $3x^2 - 2xy - 3y^2 = 0$

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

C. $2x^2 + xy - 3y^2 = 0$

D. $2x^2 - xy - 3y^2 = 0$

Answer: B

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40. The equation of the pair of lines passing through the origin and perpendicular to the pair $10x^2 + 4xy - 2y^2 = 0$ is

A. $2x^2 - 4xy + 10y^2 = 0$

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

C. $2x^2 + 4xy - 10y^2 = 0$

D. none of these

Answer: B

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41. If $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a parallel lines, then

A. $\frac{f^2 - g^2}{b^2 - h^2}$

B. $\frac{f^2 + g^2}{b^2 + h^2}$

C. $\frac{(f+g)^2}{(b+h)^2}$

D. $\frac{(f-g)^2}{(b-h)^2}$

Answer: B

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42. The product of the perpendiculars from (1, 1) to the pair of lines $x^2 + 4xy + 3y^2 = 0$ is

A. 3

B. 1

C. $\frac{4}{\sqrt{5}}$

D. $\frac{\sqrt{5}}{4}$

Answer: C

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43. If one of the lines $ax^2 + 2hxy + by^2 = 0$ bisects the angle between the aaxes in the first quadrant then

A. $a^2 + b^2 = 2h^2$

B. $a^2 + b^2 - h^2$

C. $(a + b)^2 = h^2$

D. $(a + b)^2 - 4h^2$

Answer: D

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44. Equation of pair of lines passing through (2,1) and perpendicular to the lines $6x^2 + 17xy + 12y^2 = 0$ is

A. $12x^2 - 17xy + 6y^2 - 31x - 22y + 64 = 0$

B. $12x^2 - 17xy + 6y^2 + 31x + 22y - 104 = 0$

C. $12x^2 - 17xy + 6y^2 - 31x + 22y + 20 = 0$

D. $12x^2 - 17xy + 6y^2 - 31x - 22y - 20 = 0$

Answer: C

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45. The values of p and q for which the equation $4x^2 + 2pxy + 25y^2 + 2x + 5y + q = 0$ represents a pair of parallel lines is

A. $p = 10, \quad q \in R$

B. $p = -10, \quad q = -12$

C. $p = -10, \quad q = 12$

D. $p = 10, \quad q \leq \frac{1}{4}$

Answer: D

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46. Area of the parallelogram formed by $2x^2 + 5xy + 3y^2 = 0$ and $2x^2 + 5xy + 3y^2 + 3x + 4y + 1 = 0$ is

A. 2

B. 1

C. 4

D. 3

Answer: B

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47. The four lines given by $y^2 - 4y + 3 = 0$ and $x^2 + 4xy + 4y^2 - 5y - 10y + 4 = 0$ form a

A. parallelogram

B. square

C. rhombus

D. none of these

Answer: A

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48. The four lines given by $3x^2 + 10xy + 3y^2 = 0$ and $3x^2 + 10xy + 3y^2 - 28x - 28y + 49 = 0$ form a

A. rhombus

B. square

C. triangle

D. none of these

Answer: A

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49. The four lines given by the equations $12x^2 + 7xy - 12y^2 = 0$ and $12x^2 + 7xy - 12y^2 - x + 7y - 1 = 0$ lie along the sides of a

A. square

B. parallelogram

C. rectangle

D. rhombus

Answer: A

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50. The point of intersection of perpendicular lines

$ax^2 + 3xy - 2y^2 - 5x + 5y + c = 0$ is

A. $\left(\frac{1}{3}, \frac{2}{3}\right)$

B. $\left(\frac{1}{5}, \frac{2}{5}\right)$

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

D. $\left(\frac{1}{5}, \frac{7}{5}\right)$

Answer: D

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51. The coordinates of the orthocentre of the triangle formed by the lines $2x^2 - 3xy + y^2 = 0$ and $x + y = 1$, are

A. $\left(\frac{1}{4}, \frac{1}{4}\right)$

B. (1,1)

C. $\left(\frac{1}{2}, \frac{1}{2}\right)$

D. $\left(\frac{1}{3}, \frac{1}{3}\right)$

Answer: B

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52. The area of the triangle formed by the lines $x^2 + 4xy + y^2 = 0, x + y = 1$ is

A. $\sqrt{3}$

B. 2

C. 1

D. $\frac{\sqrt{3}}{2}$

Answer: D

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53. The condition that the slope of one the lines of $ax^2 + 2hxy + by^2 = 0$ is twice the other is

A. $h^2 = ab$

B. $2h^2 = 3ab$

C. $8h^2 = 9ab$

D. $h^2 = 9ab$

Answer: C

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54. The acute angle between the lines $x^2 - 2xy\sec\alpha + y^2 = 0$ is

A. α

B. $\frac{\alpha}{2}$

C. $\frac{\pi}{2}$

D. θ

Answer: A

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55. Condition that a pair of lines are at right angle is

A. sum of the coefficients of x^2 and $y^2 = 0$

B. xy term is absent

C. constant term is absent

D. none of these

Answer: A

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56. If $x^2 - kxy - y^2 + 2y + 2 = 0$ represents a pair of lines than the value of k is

A. $\sqrt{2}$

B. 2

C. $2\sqrt{2}$

D. none of these

Answer: D

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57. The angle between the lines $x^2 + 4xy - y^2 = 0$ is

A. 90°

B. 0

C. 45°

D. 60°

Answer: A

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58. Acute angle between the lines $y^2 - 2\sqrt{3}xy + 3x^2 = 0$ is

A. 0

B. 30°

C. 45°

D. none of these

Answer: A

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59. If $x^2 + ky^2 + x - y = 0$ represents a pair of lines then $k =$

A. 1

B. -1

C. $\frac{1}{2}$

D. $-\frac{1}{2}$

Answer: B

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60. Angle between the lines $\sqrt{3}(x^2+y^2)-4xy=0$ is

A. 30°

B. 60°

C. $\frac{\tan^{-1}(1)}{2}$

D. $\frac{\tan^{-1}(2)}{\sqrt{3}}$

Answer: A

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61. Angle between the lines $x^2 + \sqrt{17}xy + 2y^2 = 0$ is

A. 30°

B. 45°

C. 60^0

D. none of these

Answer: B

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62. If $kx^2 - y^2 + 2x - y = 0$ represents a pair of lines, then $k =$

A. 4

B. -4

C. -2

D. 2

Answer: A

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63. The joint equation of the straight lines x + y = 1 and x - y = 4 is

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

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

C. $(x + y - 1)(x - y - 4) = 0$

D. $(x + y + 1)(x - y + 4) = 0$

Answer: C

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64. The combined equation of y -axis and the line $x - 1 = 0$ is

A. $x^2 = x$

B. $xy = 1$

C. $x^2 = 1$

D. $(x - 1)y = 0$

Answer: A

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65. The sum of the slopes of the lines represented by $4x^2 + 2hxy - 7y^2 = 0$ is equal to the product of the slopes then h is

A. -4

B. 4

C. -6

D. -2

Answer: D

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66. If the equation $x^2 + y^2 + 2gx + 2fy + 1 = 0$ represents a pair of lines then

A. $f^2 - g^2 = 1$

B. $f^2 + g^2 = 1$

C. $g^2 - f^2 = 1$

D. $f^2 + g^2 = \frac{1}{2}$

Answer: B

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67. Equation of the separate lines of the pair of lines, whose equation is $x^2 - xy - 12y^2 = 0$ are given by

A. $x + 4y = 0$ and $x - 3y = 0$

B. $x - 6y = 0$ and $x - 3y = 0$

C. $2x - 3y = 0$ and $x - 4y = 0$

D. $x - 4y = 0$ and $x + 3y = 0$

Answer: A

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68. If the slope of one of the lines gives by $ax^2 + 2hxy + by^2 = 0$ is 5 times the other, then

A. $5h^2 = 9ab$

B. $5h^2 = ab$

C. $h^2 = ab$

D. $9h^2 = 5ab$

Answer: A

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69. If $ax^2 - y^2 + 4x - y = 0$ represents a pair of lines then a ...

A. -16

B. 16

C. 4

D. -4

Answer: B

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70. The distance between the pair of parallel lines $x^2 + 2xy + y^2 - 8ax - 8ay - 9a^2 = 0$ is...

A. $2\sqrt{5}$ a

B. $\sqrt{10}$ a

C. $10a$

D. $5\sqrt{2}$ a

Answer: D

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71. The lines represented by $ax^2 + 2hxy + by^2 = 0$ are perpendicular to each other if

A. $a + b = 0$

B. $h^2 = a + b$

C. $h = 0$

D. $h^2 = ab$

Answer: A

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72. The area enclosed by the pair of lines $xy = 0$, the line $x - 4 = 0$ and $y + 5 = 0$ is

A. 10 sq. units

B. 20 sq. units

C. 0 sq. units

D. $\frac{5}{4}$ sq. units

Answer: B

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73. The lines given by $x^2 + 2xy - 35y^2 - 4x + 44y - 12 = 0$and the line $5x + 2y - 8 = 0$ are

A. parallel

B. concurrent

C. coincident

D. none of these

Answer: B

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74. If the pair of lines $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ intersect on y-axis then

A. $2fgh = bg^2 + ch^2$

B. $bg^2 \neq ch^2$

C. $abc = 2fgh$

D. none of these

Answer: A

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75. The pair of lines represented by $3ax^2 + 5xy + (a^2 - 2)y^2 = 0$ are perpendicular to each other for

A. two values of, a

B. for all a

C. for one value of a

D. for no value of a

Answer: A

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76. If the pairs of lines $x^2 - 2pxy - y^2 = 0$ and $x^2 - 2qxy - y^2 = 0$ be such that each pair bisects the angle between the other pair then

A. $p = -q$

B. $pq = 1$

C. $pq = -1$

D. $p = q$

Answer: C

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77. If the sum of the slopes of the lines given by $x^2 - 2cxy - 7y^2 = 0$ is four times their product then c has the value

A. 1

B. -1

C. 2

D. -2

Answer: C

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78. If one of the lines given by $6x^2 - xy + 4cy^2 = 0$ is $3x + 4y = 0,$ then $c =$

A. 3

B. -1

C. 1

D. -3

Answer: D

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79. If the pair of lines $ax^2 + 2(a+b)xy + by^2 = 0$ lie along diameters of a circle and divide the circle into four sectors such that the area of one of the sectors is thrice the area of another sectors, then:

A. $3a^2 + 10ab + 3b^2 = 0$

B. $3a^2 + 2ab + 3b^2 = 0$

C. $3a^2 - 10ab + 3b^2 = 0$

D. $3a^2 - 2ab + 3b^2 = 0$

Answer: B

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80. If the angle between the pair of lines $x^2 - 3xy + \lambda y^2 + 3x - 5y + 2 = 0$ is $\tan^{-1}\left(\frac{1}{3}\right)$ where λ is a non-negative real number, then $\lambda =$

A. 2

B. 0

C. 3

D. 1

Answer: A

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81. The triangle formed by $x^2 - 3y^2 = 0$ and $x = 4$ is

A. isosceles

B. equilateral

C. angled

D. none of these

Answer: B

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82. The distance between the pair of parallel lines $x^2 + 4xy + 4y^2 + 3x + 6y - 4 = 0$ is

A. $\sqrt{5}$

B. $\frac{2}{\sqrt{5}}$

C. $\frac{1}{\sqrt{5}}$

D. $\frac{\sqrt{5}}{2}$

Answer: A

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83. If the lines $2x^2 + 7xy + 3y^2 - 9x - 7y + k = 0$ represents a pair of lines, then $k =$

A. 4

B. 2

C. 1

D. -4

Answer: A

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84. The equation of bisectors of the angle between the two lines $2x^2 - 3xy + y^2 = 0$ is

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

B. $3x^2 - 2xy - 3y^2 = 0$

C. $3x^2 + 2xy + 3y^2 = 0$

D. $3x^2 - 2xy' + 3y^2 = 0$

Answer: A

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85. The quadrilateral formed by the pair of lines $xy + x + y + 1 = 0, xy + 3x + 3y + 9 = 0$ is a

A. parallelogram

B. rhombus

C. rectangle

D. square

Answer: D

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86. If $xy + x + y + 1 = 0$ and $x + qy - 3 = 0$ are concurrent then $q =$

A. 3

B. 2

C. -4

D. 1

Answer: C

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87. The equation $x^2 - 3xy + \lambda y^2 + 3x - 5y + 2 = 0$, whose λ is a real number, represents a pair of lines. If θ is the angle between the lines then $opera \to rname(\cos ec)^2\theta =$

A. 3

B. 9

C. 10

D. 100

Answer: C

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88. Circumcentre of the triangle formed by the lines $xy+2x+2y+4=0$ and $x+y+2=0$ is

A. (0,0)

B. (-2,-2)

C. (-1,-1)

D. (-1,-2)

Answer: C

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89. The distance between the parallel lines $9x^2 - 6xy + y^2 + 18x - 6y + 8 = 0$ is

A. $\frac{1}{\sqrt{10}}$

B. $\frac{2}{\sqrt{10}}$

C. $\frac{4}{\sqrt{10}}$

D. $\sqrt{10}$

Answer: B

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90. The angle between the pair of lines $2x^2 + 5xy + 2y^2 + 3x + 3y + 1 = 0$ is

A. $\cos^{-1}\left(\frac{4}{5}\right)$

B. $\tan^{-1}\left(\frac{4}{5}\right)$

C. 0

D. $\frac{\pi}{2}$

Answer: A

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91. The combined equation to a pair of lines passing through the origin and inclined 30° and 60° respectively with x -axis is

A. $\sqrt{3}\left(x^2+y^2\right)=4xy$

B. $4\left(x^2+y^2\right)=\sqrt{3}xy$

C. $4\left(x^2+y^2\right)=\sqrt{3}xy$

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

Answer: A

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92. The pair of Lines $h\left(x^2-y^2\right)+pxy=0$ bisects the angle between the pair $ax^2+2hxy+by^2=0$ then the value of p is

A. $a-b$

B. $b-a$

C. $a+b$

D. $a+b$

Answer: B

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93. The equation of the pair of bisectors of the angles between the pair of lines $x^2 - 2axy - y^2 = 0$ is $x^2 - 2bxy - y^2 = 0$. Then

A. $ab = 1$

B. $ab + 1 = 0$

C. $ab = 2$

D. $ab + 2 = 0$

Answer: B

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94. The triangle formed by the pair of lines $x^2 - 4y^2 = 0$ and the line $x - a = 0$ is always

A. equilateral

B. isosceles

C. angled

D. scalene

Answer: B

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95. Point of intersection of pair of lines $x^2 + xy + 2y^2 - 3x + 2y + 4 = 0$ is

A. (1,2)

B. (-1,2)

C. (-2,1)

D. (2,-1)

Answer: D

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96. If $ax^2 + 6xy + by^2 - 10x + 10y - 6 = 0$ represents a pair of perpendicular lines, then $|a| =$

A. 1

B. 4

C. -1

D. 3

Answer: B

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97. The difference of slopes of the lines represented by

$$y^2 - 2xy\sec^2\alpha + (3 + \tan^2\alpha)(-1 + \tan^2\alpha)x^2 = 0$$

is

A. 2

B. 4

C. 6

D. 8

Answer: B

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98. The angle between the pair of lines $2(x+2)^2+3(x+2)(y-2)-2(y-2)^2=0$ is

A. $\frac{\pi}{4}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{6}$

D. $\frac{\pi}{2}$

Answer: D

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99. The equation of the pair of lines through (1,-1) and perpendicular to the pair of lines $x^2 - xy - 2y^2 = 0$ is

A. $2x^2 - xy + y^2 + 5x + y + 2 = 0$

B. $2x^2 - xy - y^2 - 5x - y + 2 = 0$

C. $x^2 - xy + 2y^2 - 5x - y - 2 = 0$

D. $2x^2 - xy - y^2 + 5x + y - 2 = 0$

Answer: B

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100. The equation of the line common to the pair of lines

$(p^2 - q^2)x^2 + (q^2 - r^2)xy + (r^2 - p^2)y^2 = 0$

and $(l - m)x^2 + (m - n)xy + (n - l)y^2 = 0$ is

A. $x + y = 0$

B. $x - y = 0$

C. $x + y = pqr$

D. $x - y = pqr$

Answer: B

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101. If the pair of lines given by $\left(x^2+y^2\right)\sin^2\alpha=(x\cos\alpha-y\sin\alpha)^2$ are perpendicular to each other then $\alpha=$

A. $\frac{\pi}{2}$

B. 0

C. $\frac{\pi}{4}$

D. $\frac{\pi}{3}$

Answer: C

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102. If a, h, b are in A.P. then the triangular area formed by the pair of lines $ax^2 + 2hxy + by^2 = 0$ and the line $x - y = -2$ is, in square units

A. $\left|\frac{a+b}{a-b}\right|$

B. $\left|\frac{a^2+b^2}{a-b}\right|$

C. $\left|\frac{a-b}{a+b}\right|$

D. |(a^(2)+b^(2))/(a+b)|`

Answer: C

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103. If the equation $ax^2 + 5xy - 6y^2 - 10x + 11y + c = 0$, represents two perpendicular lines then $c =$

A. 6

B. -6

C. 4

D. -4

Answer: D

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104. The equation of the pair of lines through the points (a, b) parallel to the coordinate axes is

A. $(x - b)(y - a) = 0$

B. $(x - a)(y + b) = 0$

C. $(x - a)(y - b) = 0$

D. $(x + a)(y - b) = 0$

Answer: C

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105. If the equation $\lambda x^2 - 5xy + 6y^2 + x - 3y = 0$ represents a pair of lines, then their point of intersection is

A. (-3,-1)

B. (-1,-3)

C. (3,1)

D. (1,3)

Answer: A

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106. The product of the perpendiculars from (-1,2) to the pair of-lines $2x^2 - 5xy + 2y^2 = 0$ is

A. 4

B. 3

C. 8

D. $\frac{5}{2}$

Answer: A

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107. Area of the triangle formed by the lines $3x^2 - 4xy + y^2 = 0, \quad 2x - y = 6$ is

A. 16

B. 25

C. 36

D. 49

Answer: C

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108. The orthocentre of the triangle formed by the lines $x + 3y = 10$ and $6x^2 + xy - y^2 = 0$ is

A. (1,3)

B. (3,1)

C. (-1,3)

D. (1,-3)

Answer: A

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109. If one of the lines of the pair $ax^2 + 2hxy + by^2 = 0$ bisects the angle between positive directions of the axes, then a, b, h satisfy the relation

A. $a + b = 2|h|$

B. $a + b = 2|h|$

C. $a - b - 2|h|$

D. $(a - b)^2 = 4h^2$

Answer: B

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110. If the slope of one line is twice the slope of the other in the pair of lines $ax^2 + 2hxy + by^2 = 0$ then $8h^2 =$

A. $-9ab$

B. $9ab$

C. $7ab$

D. $-7ab$

Answer: B

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111. If the pair of lines $xy - x - y + 1 = 0$ and the line $ax + 2y - 3 = 0$ are concurrent then $a =$

A. -2

B. 3

C. 1

D. 0

Answer: C

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112. If the angle 2θ is acute, then the acute angle between the pair of lines $x^2(\cos\theta - \sin\theta) + 2xy\cos\theta + y^2(\cos\theta + \sin\theta) = 0$ is

A. 2θ

B. $\frac{\theta}{2}$

C. $\frac{\theta}{3}$

D. θ

Answer: D

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113. If the coordinate axes are the bisectors of the angles between the pair of lines $ax^2 + 2hxy + by^2 = 0$where $h^2 > ab$ and $a \neq b$, then

A. $a + b = 0$

B. $a - b = 0$

C. $h = 0, a + b \neq 0$

D. $h \neq 0, a + b = 0$

Answer: B

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114. If the pair of lines given by $ax^2 + 2hxy + by^2 = 0 \quad (h^2 > ab)$ forms an equilateral triangle with $Ax + By + C = 0$ then $(a + 3b)(3a + b) =$

A. h^2

B. $-h^2$

C. $2h^2$

D. $4h^2$

Answer: D

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115. The area of the triangle formed by the lines $x^2 + 4xy + y^2 = 0, x + y = 1$ is

A. $\frac{|ax_1^2 + 2hx_1y_1 + by_1^2|}{\sqrt{(a-b)^2 + 4h^2}}$

B. $\frac{c^2}{2(a^2+b^2)}$

C. $\frac{|ax_1^2 + 2hx_1y_1 + by_1^2|}{\sqrt{(a+b)^2 + 4h^2}}$

D. $\frac{|ax_1^2 - 2hx_1y_1 + by_1^2|}{\sqrt{(a-b)^2 + 4h^2}}$

Answer: D

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116. The product of the perpendicular distances from the origin on the pair of lines $12x^2 + 25xy + 12y^2 + 10x + 11y + 2 = 0$is

A. $\frac{1}{25}$

B. $\frac{2}{25}$

C. $\frac{3}{25}$

D. $\frac{4}{25}$

Answer: B

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117. The centroid of the triangle formed by the pair of lines $12x^2 - 20xy + 7y^2 = 0$ and the line $2x - 3y + 4 = 0$ is

A. $\left(-\frac{7}{3}, \frac{7}{3}\right)$

B. $\left(-\frac{8}{3}, \frac{8}{3}\right)$

C. $\left(\frac{8}{3}, \frac{8}{3}\right)$

D. $\left(\frac{4}{3}, \frac{4}{3}\right)$

Answer: C

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118. If m is the slope of one of the lines represented by $ax^2 + 2hxy + by^2 = 0$, then $(h + bm)^2$ =

A. $h^2 - ab$

B. $h^2 + ab$

C. $(a - b)^2$

D. $(a + b)^2$

Answer: A

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119. The perpendicular distance between the lines $9x^2 - 24xy + 16y^2 + 21x - 28y + 10 = 0$ is

A. $\frac{7}{5}$

B. $\frac{3}{5}$

C. $\frac{4}{5}$

D. $\frac{1}{5}$

Answer: B

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120. If the line px +qy =0 coincides with one of the lines given by

$ax^2 + 2hxty + by^2 = 0$ then

A. $ap^2 + 2hpq + bq^2 = 0$

B. $aq^2 + 2hpq + bq^2 = 0$

C. $aq^2 - 2hpq + bp^2 = 0$

D. none of these

Answer: C

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121. Let PQR be a right-angled isosceles triangle right-angled at P(2, 1). If the equation of the line QR is $2x + y = 3$, then the equation representing the pair of lines PQ and PR is :

A. $3x^2 - 3y^2 + 8xy + 20xy + 10y + 25 = 0$

B. $3x^2 - 3y^2 + 8xy - 20xy - 10y + 25 = 0$

C. $3x^2 - 3y^2 + 8xy + 10x + 15y + 20 = 0$

D. $3x^2 - 3y^2 - 8xy - 10x - 15y - 20 = 0$

Answer: B

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122. If one of the lines of

$$my^2 + \left(1 - m^2\right)xy - mx^2 = 0$$

is a bisector of the angle between the lines xy=0 then m is

A. 1

B. 2

C. $-\frac{1}{2}$

D. -2

Answer: A

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123. If the gradient of one of the lines given by $x^2 + 2hxy + 2y^2 = 0$ is twice that of the other, then $h =$

A. ±2

B. ±3

C. ±1

D. $\pm \frac{3}{2}$

Answer: B

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124. The angle between the lines $x^2 - y^2 - 2x - 1 = 0$ is

A. 90°

B. 60°

C. 75°

D. 36°

Answer: A

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125. The product of perpendiculars let fall from the point (x_1, y_1) upon the lines represented by $ax^2 + 2hxy + by^2 = 0$ is

A. $\left(\left|ax_1^2 + 2hx_1y_1 + by_1^2\right|\right)\left(\sqrt{(a-b)^2 + 4h^2}\right)$

B. $\left(\left|ax_1^2 + 2hx_1y_1 + by_1^2\right|\right)\left(\sqrt{(a-b)^2 + h^2}\right)$

C. $\dfrac{\left|ax_1^2 + 2hx_1y_1 + by_1^2\right|}{\sqrt{\left(a-b\right)^2 + 4h^2}}$

D. $\left(\left|ax_1^2 - 2hx_1y_1 + by_1^2\right|\right)\left(\sqrt{(a-b)^3 + 4h^2}\right)$

Answer: A

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126. Equation of pair of lines drawn through (1, 1) and perpendicular to the pair of lines $3x^2 - 7xy + 2y^2 = 0$ is

A. $2x^2 + 7x - 11x + 6 = 0$

B. $2(x-1)^2 + 7(x-1)(y-1) - 3y^2 = 0$

C.

$$2(x-1)^2 + 7(x-1)(y-1) - 3(y-1)^2 = 0$$

D. none of these

Answer: D

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127. The equatio $y^2 - x^2 + 2x - 1 = 0$ represents

A. a hyperbola

B. an ellipse

C. a pair of lines

D. a rectangular hyperbola

Answer: C

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128. The equation $4x^2 - 24xy + 11y^2 = 0$ represents

A. two parallel lines

B. two perpendicular lines

C. two lines through the origin

D. a circle

Answer: C

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129. The equation of pair of lines joining origin to the points of intersection of $x^2 + y^2 = 9$ and $x + y = 3$ is

A. $x^2 + (3 - x)^2 - 9$

B. $xy = 0$

C. $(3 + y)^2 + y^2 = 9$

D. $(x - y)^2 = 9$

Answer: B

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