MATHS

BOOKS - TARGET MATHS (HINGLISH)

PAIR OF STRAIGHT LINES

Classical Thinking

1. The joint equation of pair of lines having slopes 1 and 3 and passing through the origin is

A. $4x^2 - 3x - y^2 = 0$

B. $3x^2 - 4xy + y^2 = 0$

C. $3x^2 - 4xy - y^2 = 0$

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

Answer: B

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2. The equation of the lines passing through the origin and having slopes 3 and $\frac{1}{3}$ is

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

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

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

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

Answer: B

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3. The combined equation of the lines passing through the origin and having slopes 2 and $-\frac{1}{2}$ is

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

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

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

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

Answer: A

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4. Separate equations of lines for a pair of lines whose equation is $x^2 + xy - 12y^2 = 0$ are

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

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

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

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

Answer: D

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5. 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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6. The separate equations of the lines represented by $3x^2 - 10xy - 8y^2 = 0$ are

A. $3x + 2y = 0$ and $x - 4y = 0$

B. $2x + 2y = 0$ and $2x - y = 0$

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

D. $-3x + 2y = 0$ and $x + 2y = 0$

Answer: A

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7. Separate equations of lines $6x^2 - 5xy + y^2 = 0$ are

A. $3x - y = 0, 2x - y = 0$

B. $3x + y = 0, 2x - y = 0$

C. $3x - y = 0, 2x + y = 0$

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

Answer: A

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8. Joint equation of two lines, through (x_1, y_1), parallel to two lines $ax^2 + 2hxy + by^2 = 0$ is

A.

$$a(y - y_1)^2 + 2h(x - x_1)(y - y_1) + b(x - x_1)^2 = 0$$

B.

$$a(y - y_1)^2 - 2h(x - x_1)(y - y_1) + b(x - x_1)^2 = 0$$

C.

$$b(y-y_1)^2+2h(x-x_1)(y-y_1)+a(x-x_1)^2=0$$

D. $ax_1^2+2hx_1y_1+by_1^2=0$

Answer: C

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9. Equation of pair of lines passing through (3,4) and parallel to lines $x^2-y^2=0$

A. $x^2-y^2-6x+8y-9=0$

B. $x^2-y^2-6x+8y-7=0$

C. $x^2-y^2-4x+8y-1=0$

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

Answer: B

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10. The combined equation of the pair of lines through the origin and perpendicular to the pair of lines given by $ax^2 + 2hxy + by^2 = 0$, is

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

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

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

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

Answer: C

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11. Fouation of the pair of straight lines through origin and perpendicular to the pair of straight lines $5x^2 - 7xy - 3y^2 = 0$ is

A. $3x^2 - 7xy - 5y^2 = 0$

B. $3x^2 + 7xy - 5y^2 = 0$

C. $3x^2 - 7xy + 5y^2 = 0$

D. $3x^2 + 7xy + 5y^2 = 0$

Answer: A

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12. The sum of the slopes of the lines represented by $x^2 - xy - 6y^2 = 0$ is

A. $\frac{-1}{6}$

B. -6

C. 6

D. $\frac{1}{6}$

Answer: A

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13. If the slope of one line of the pair of lines represented by $ax^2 + 10xy + y^2 = 0$ is four times the slope of the other line, then $a =$

A. 1

B. 2

C. 4

D. 16

Answer: D

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14. If the slope of one line in the pair $ax^2 + 4xy + y^2 = 0$ is three times the other, then a =

A. 1

B. 2

C. 3

D. 4

Answer: C

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15. If the slope of one of the lines represented by $ax^2 + (3a + 1)xy + 3y^2 = 0$ be reciprocal of the slope of the other, then the slope of the lines are

A. $\frac{3}{2}, \frac{2}{3}$

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

C. $\frac{1}{3}, 3$

D. $\frac{-1}{3}, -3$

Answer: D

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16. If the lines represented by the equation $6x^2 + 41xy - 7y^2 = 0$ make angles α and β with X-axis, then $\tan\alpha.\ \tan\beta =$

A. $-\frac{6}{7}$

B. $\frac{6}{7}$

C. $\frac{7}{6}$

D. $-\frac{7}{6}$

Answer: A

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17. The acute angle between the lines represented by $6x^2 - xy - y^2 = 0$ is

A. 45°

B. 30°

C. 60°

D. 90°

Answer: A

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18. The angle between the lines represented by $\sqrt{3}xy - y^2 = 0$ is

A. 30°

B. 45°

C. 60°

D. 90°

Answer: C

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19. The acute angle between the lines represented by the equation $11y^2 - 24xy + 4x^2 = 0$ are

A. $\tan^{-1}\frac{3}{2}$

B. $\tan^{-1}\frac{4}{3}$

C. $\tan^{-1}\frac{4}{5}$

D. $\tan^{-1}\frac{1}{3}$

Answer: B

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20. Angle between the lines $2x^2 - 3xy + y^2 = 0$ is

A. $\tan^{-1}(\sqrt{3})$

B. $\cot^{-1}(\sqrt{3})$

C. $\cot^{-1}(3)$

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

Answer: C

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21. If the angle θ is acute, then the acute angle between

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

is

A. 2θ

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

C. θ

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

Answer: C

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22. If the acute angle between the lines $x^2 - 4hxy + 3y^2 = 0$ is 60° then $h =$

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

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

C. $\pm \frac{\sqrt{15}}{2}$

D. 1

Answer: C

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23. If $3x^2 + 18xy + by^2 = 0$ represents a pair of lines, making an angle π with each other, then $b =$

A. 3

B. 9

C. 27

D. 81

Answer: C

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24. The angle between the pair of straight lines $3x^2 + 10xy + 8y^2 = 0$ is $\tan^{-1}(p)$, where $p =$

A. $\frac{-5}{11}$

B. $\frac{-3}{11}$

C. $\frac{2}{11}$

D. $\frac{8}{11}$

Answer: C

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25. The equation $3x^2 + 2hxy + 3y^2 = 0$ represents a pair of straight lines passing through the origin. The two lines are

A. real and distinct if $h^2 > 3$.

B. real and distinct if $h^2 \geq 9$.

C. real and coincident if $h^2 > 3$

D. real and coincident if $h^2 \geq 3$.

Answer: D

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26. The straight lines represented by the equation $9x^2 - 12xy + 4y^2 = 0$ are

A. coincedent

B. perpendicular

C. interset at 60°

D. inclined at an angle of 45°

Answer: A

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27. Which of the following equations represents a pair of real and coincident straight lines?

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

B. $4x^2 + 4xy - y^2 = 11$

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

D. $3x^2 + 3y^2 = 4$

Answer: A

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28. $6x^2 + hxy + 12y^2 = 0$ represents pair of parallel straight lines, if h is

A. $\pm 6\sqrt{2}$

B. $\pm \sqrt{2}$

C. $\pm 12\sqrt{2}$

D. $\pm\sqrt{6}$

Answer: C

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29. If the equation $4x^2 + hxy + y^2 = 0$ represent coincident lines, then h is equal to

A. ± 2

B. ± 4

C. ± 1

D. 0

Answer: B

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30. Two lines represented by equation $x^2 + xy + y^2 = 0$ are

A. coincident

B. parallel

C. mutually perpendicular

D. imaginary

Answer: D

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31. The angle between the lines given by the equation $\lambda y^2 + (1 - \lambda^2)xy - \lambda x^2 = 0$ is

A. 45°

B. 60°

C. 90°

D. 15°

Answer: C

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32. Angle between the pair of lines $xy = 0$ is

A. 30°

B. 45°

C. 90°

D. 60°

Answer: C

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33. Pair of straight lines perpendicular to each other are represented by

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

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

C. $2x^2 = y(2x + y)$

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

Answer: A

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34. The equation $x^2 - 7xy - y^2 = 0$ represents

A. circle

B. pair of parallel straight lines

C. pair of perpendicular straight lines

D. pair of non-perpendicular straight lines

Answer: C

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35. If the lines represented by $3y^2 + 9xy + kx^2 = 0$ are perpendicular to eachother then $k =$

A. 1

B. -2

C. -3

D. 0

Answer: C

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36. If lines $a^2x^2 + bcy^2 = a(b+c)xy$ are mutually perpendicular then

A. $c^2 + ab = 0$

B. $b^2 + ca = 0$

C. $a^2 + bc = 0$

D. $a^2 + b^2 + c^2 = 0$

Answer: C

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37. Which of the following represents pair of lines?

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

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

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

D. $2x^2 + 3xy - 4y^2 + 5x + 5y + 3 = 0$

Answer: A

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38. For which value of $'p', y^2 + xy + px^2 - x - 2y = 0$ represents a pair of straight lines

A. 2

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

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

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

Answer: C

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39. If $6x^2 + 11xy - 10y^2 + x + 31y + k = 0$ represents a pair of straight lines , then k is equal to.

A. -15

B. 6

C. -10

D. -4

Answer: A

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40. The value of λ for which the equation $x^2 - y^2 - x - \lambda y - 2 = 0$ represent a pair of straight line, are

A. 3,-3

B. $-3, 1$

C. $3, 1$

D. $-1, 1$

Answer: A

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41. The value of h for which the equation $3x^2 + 2hxy - 3y^2 - 40x + 30y - 75 = 0$ represents a pair of straight lines , are

A. 4,4

B. 4,6

C. 4,-4

D. 0,4

Answer: A

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42. The equation of the perpendiculars drawn from the origin to the lines represented by the equation $2x^2 - 10xy + 12y^2 + 5x - 16y - 3 = 0$, is

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

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

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

D. $6x^2 - xy - y^2 = 0$

Answer: A

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43. The point of intersection of the lines $2x^2 - 5xy + 3y^2 + 8x - 9y + 6 = 0$ is

A. $(-3, 4)$

B. $(3, -5)$

C. $(3, 4)$

D. $(-3, -5)$

Answer: C

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44. The point of intersection of lines gives by the equation $3x^2 + 10xy + 3y^2 - 15x - 21y + 18 = 0$ is

A. $\left(\frac{13}{8}, \frac{3}{8}\right)$

B. $\left(\frac{3}{8}, \frac{15}{8}\right)$

C. $\left(\frac{15}{8}, \frac{3}{8}\right)$

D. $\left(\frac{3}{8}, \frac{13}{8}\right)$

Answer: C

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45. The equation $6x^2 - xy - 12y^2 - 8x + 29y - 14 = 0$ represents a pair of lines, then the angle between them is .....?

A. $\tan^{-1}\left(\frac{17}{6}\right)$

B. $\tan^{-1}\left(\frac{3}{4}\right)$

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

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

Answer: A

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46. The lines represented by the equation $x^2 + 2\sqrt{3}xy + 3y^2 - 3x - 3\sqrt{3}y - 4 = 0$ are

A. Perpendicular to each other

B. Parallel

C. Inclined at 45° to each other

D. Inclined at 60° to each other

Answer: B

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47. If equation $4x^2 + 2pxy + 25y^2 + 2x + 5y - 1 = 0$ represents parallel lines, then p is equal to

A. -10

B. 10

C. 5

D. -2

Answer: B

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48. Angle between straight lines given by $3y^2 - 8xy - 3x^2 - 29x + 3y - 18 = 0$ is

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

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

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

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

Answer: A

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49. The angle between the pair of straight lines $x^2 - y^2 - 2y - 1 = 0$ is

A. 90°

B. 60°

C. 45°

D. 0°

Answer: A

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50. Measure of angle between the lines $3xy - 4y = 0$ is

A. 30°

B. 60°

C. 90°

D. 120°

Answer: C

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51. If the equation $px^2 - 8xy + 3y^2 + 14x + 2y + q = 0$ represents a pair of parallel lines, then

A. $p = 2, q = 3$

B. $p = -3, q = 2$

C. $p = -3, q = -8$

D. $p = 3, q = 2$

Answer: C

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52. If $ax^2 + 6xy + 3y^2 - 10x + 10y - 6 = 0$ represents a pair of perpendicular lines, then $|a| =$

A. 1

B. 4

C. 2

D. 3

Answer: B

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Critical Thinking

1. The joint equation of pair of lines passing through the origin and parallel to the lines $y = m_1x + c_1$ and $y = m_2x + c_2$ is

A. $m_1m_2x^2 - (m_1 + m_2)xy + y^2 = 0$

B. $m_1m_2x^2 + (m_1 + m_2)xy + y^2 = 0$

C. $m_1m_2y^2 - (m_1 + m_2)xy + x^2 = 0$

D. $m_1m_2y^2 + (m_1 + m_2) + x^2 = 0$

Answer: A

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2. The combined equation of the lines which pass through the origin and eahc of which makes an angle of 30° with the line $2x - y = 0$ is

A. $11x^2 + 16xy - y^2 = 0$

B. $11x^2 + 16xy + y^2 = 0$

C. $11x^2 - 16xy + y^2 = 0$

D. $11x^2 - 16xy - y^2 = 0$

Answer: D

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3. The equation of the lines through the origin which form two of the sides of the equilateral triangle having $x = 2$ as the third side is

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

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

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

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

Answer: C

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4. Combined equation of the two lines passing through the origin, forming an equilateral triangle with the line $x + y + \sqrt{3} = 0$ is

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

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

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

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

Answer: B

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5. The equations of the lines represented by the equation $ax^2 + (a+b)xy + by^2 + x + y = 0$ are

A. $ax + by + 1 = 0, x + y = 0$

B. $ax + by - 1 = 0, x + y = 0$

C. $ax + by + 1 = 0, x - y = 0$

D. $ay + bx + 1 = 0, x + y = 0$

Answer: A

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6. The equation of one of the lines represented by the equation $pq(x^2 - y^2) + (p^2 - q^2)xy = 0$, is

A. $px - qy = 0$

B. $px + qy = 0$

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

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

Answer: A

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7. One of the lines represented by the equation $x^2 + 6xy = 0$ is

A. Parallel to x-axis

B. Paralle to Y-axis

C. X-axis

D. Y-axis

Answer: D

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8. The equation $y^2 - x^2 + 2x - 1 = 0$, represents

A. hyperbola

B. an ellipse

C. a pair of straight line

D. a rectangular hyperbola

Answer: C

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9. The equation

$$(x-5)^2+(x-5)(y-6)-2(y-6)^2=0$$

represents

A. A circle

B. Two straight lines passing through origin

C. Two straight lines passing through the point (5,6)

D. An ellipse

Answer: C

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10. The point of intersection of the lines represented by equation

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

A. (2,2)

B. $(-2,-2)$

C. $(-2, 2)$

D. $(2, -2)$

Answer: C

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11. $a(x^2 - y^2) + xy = 0$ represents a pair of straight lines for

A. $a = 1$ only

B. $a = 1$ or -1 only

C. $a = 0$ only

D. all real values of a.

Answer: D

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12. Joint equation of two lines through (2,-3) perpendicular to two lines $3x^2 + xy - 2y^2 = 0$ is

A. $2x^2 + xy - 3y^2 - 5x - 20y = 25 = 0$

B. $-2x^2 - xy + 3y^2 - 5x - 20y - 25 = 0$

C. $3x^2 + xy - 2y^2 - 5x - 20y - 25 = 0$

D. $3x^2 - xy + 2y^2 + 5x - 20y - 25 = 0$

Answer: A

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13. The pair of straight lines passing through that point $(1, 2)$ and perpendicular to the pair of straight lines $3x^2 - 8xy + 5y^2 = 0$, is

A. $(5x + 3y + 11)(x + y + 3) = 0$

B. $(5x + 3y - 11)(x - y - 3) = 0$

C. $(3x + 5y - 11)(x + y + 3) = 0$

D. $(3x - 5y + 11)(x + y - 3) = 0$

Answer: B

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14. If one of the lines is given by $kx^2 - 5xy - 6y^2 = 0$ si $4x + 3y = 0$ then value of k is

A. 1

B. 3

C. 4

D. 2

Answer: C

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15. If the pairs of lines $x^2 + 2xy + ay^2 = 0$ and $ax^2 + 2xy + y^2 = 0$ have exactly one line in common,

then the joint equation of the other two lines is given by $3x^2 + 8xy - 3y^2 = 0$ $3x^2 + 10xy + 3y^2 = 0$ $y^2 + 2xy - 3x^2 = 0$ $x^2 + 2xy - 3y^2 = 0$

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

B. $3x^2 + 10xy + 3y^2 = 0$

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

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

Answer: B

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16. If one of the lines represented by the equation $ax^2 + 2hxy + by^2 = 0$ is coincident with one of the lines represented by $a'x^2 + 2h'xy + b'y^2 = 0$, then

A. $(ab' + a'b)^2 = 4(ah' - a'h)(hb' - h'b)$

B. $(ab' + a'b)^2 = 4(ah' - a'h)(hb' - h'b)$

C. $(ab' - a'b)^2 = (ah' - a'h)(hb' - h'b)$

D. $(a'b' - ab)^2 = (ah - a'h')(hb - h'b')$

Answer: A

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17. If the sum of the slopes of the lines represented by the equation $x^2 - 2xy\tan A - y^2 = 0$ be 4 then $\angle A =$

A. 0°

B. 45°

C. 60°

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

Answer: D

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

A. ab

B. $2ab$

C. $7ab$

D. $9ab$

Answer: D

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19. The condition that the gradient of one line is twice is gradient of another line represented by the equation $ax^2 + 2hx + by^2 = 0$ is

A. $ab = \frac{8b^2}{9}$

B. $ab = h^2$

C. $h^2 + ab = 0$

D. $h = a + b$

Answer: A

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20. If the slope of one of the lines represented by the equation $ax^2 + 2hxy + by^2 = 0$, is λ that of the other , then

A. $4\lambda h = ab(1 + \lambda)$

B. $\lambda h = ab(1 + \lambda)^2$

C. $4\lambda h^2 = ab(1 + \lambda)^2$

D. $4 = abh\left(1 + \lambda^2\right)$

Answer: C

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21. If the slope of one of the lines represented by $ax^2 + 2hxy + by^2 = 0$ be the square of the other, then $\frac{a+b}{h} + \frac{8h^2}{ab} =$

A. $a^2b + ab^2 - 6abh + 8h^3 = 0$

B. $a^2b + ab^2 + 6abh + 8h^3 = 0$

C. $a^2b + ab^2 - 3abh + 8h^3 = 0$

D. $a^2b + ab^2 - 6abh - 8h^3 = 0$

Answer: A

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22. If m_1, m_2 are slopes of lines represented by $2x^2 - 5xy + 3y^2 = 0$ then equation of lines passing through origin with slopes $\frac{1}{m_1}, \frac{1}{m_2}$ will be

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

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

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

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

Answer: A

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23. If two lines $ax^2 + 2hxy + by^2 = 0$ are equally inclined with co-ordinate axes, then

A. $h = 0$ and $ab < 0$

B. $a = b$

C. $a = \pm b$

D. $ab > 0, h = 0$

Answer: B

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24. Difference of slopes of the lines represented by the equation

$x^2\left(\sec^2\theta - \sin^2\theta\right) - 2xy\tan\theta + y^2\sin^2\theta = 0$ is

(A) 4

(B) 3

(C) 2

(D) None of these

A. 4

B. 3

C. 2

D. None of these

Answer: C

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25. The difference of the tangents of the angles, which the lines

$$\left(\tan^2\alpha + \cos^2\alpha\right)x^2 - 2xy\tan n\alpha + \sin^2\alpha y^2 = 0$$

make with the X-axis, is

A. 1

B. 2

C. 3

D. 4

Answer: B

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26. The equation of the pair of straight lines, each of which makes an angle α with the line $y = x$ is

A. $x^2 + 2xy\sec 2\alpha + y^2 = 0$

B. $x^2 + 2xy\cos ec2\alpha + y^2 = 0$

C. $x^2 - 2xy\cos ec2\alpha + y^2 = 0$

D. $x^2 - 2xy\sec 2\alpha + y^2 = 0$

Answer: D

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27. If the line given by $ax^2 + 2hxy + by^2 = 0$ are equally inclined to the co-ordinate axes, then

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

B. $a + b = -2h$

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

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

Answer: B

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28. One of the lines represented by the equation $ax^2 + bxy + cy^2 = 0$ bisects an angle between the co-ordinate axes

A. a,b,c are in AP

B. a,b,c are in G.P.

C. a,b,c are in H.P

D. $a + b + c = 0$

Answer: D

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29. If the equation $ax^2 + 2hxy + by^2 = 0$ has one line as the bisector of angle between the co-ordinate axes then

A. $(a-b)^2 = h^2$

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

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

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

Answer: D

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30. If the lines represented by the equation $2x^2 - 3xy + y^2 = 0$ make angles α and β with X-axis, then $\cot^2 \alpha + \cot^2 \beta$ is equal to

A. 0

B. $\frac{3}{2}$

C. $\frac{7}{4}$

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

Answer: D

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31. If the lines represented by the equation $ax^2 - bxy - y^2 = 0$ make angles α and β with the X-axis, then $\tan(\alpha + \beta) =$

A. $\frac{b}{1+a}$

B. $\frac{-b}{1+a}$

C. $\frac{a}{1+b}$

D. $\frac{b}{1-a}$

Answer: B

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32. If the acute angle between the lines $ax^2 + 2hxy + by^2 = 0$ is 60°, then show that $(a + 3b)(3a + b) = 4h^2$.

A. 30°

B. 45°

C. 60°

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

Answer: C

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33. Find the angle between the lines repersented by the equation $x^2 - 2pxy + y^2 = 0$

A. $\sec^{-1} p$

B. $\cos^{-1} p$

C. $\tan^{-1} p$

D. $\sin^{-1} p$

Answer: A

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34. The angle between the lines represented by the equation $\left(x^2+y^2\right)\sin\theta+2xy=0$ is

A. θ

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

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

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

Answer: C

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35. The angle between the lines represented by the equation $ax^2 + xy + by^2 = 0$ will be 45° if

A. $a = 1, b = 6$

B. $a = 1, b = -6$

C. $a = 6, b = 1$

D. $a = 1, b = 1$

Answer: B

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36. If the angle between the lines represented by the equation $y^2 + kxy - x^2 \tan^2 A = 0 is 2A$, then K is equal to

A. 0

B. 1

C. 2

D. $\tan A$

Answer: A

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37. If acute angle between lines $ax^2 + 2hxy + by^2 = 0$ is congruent to that between lines $2x^2 - 5xy + 3y^2 = 0$ and $k(h^2 - ab) = (a + b)^2$ then $k =$

A. $-(10)^2$

B. $(-10)^2$

C. -10

D. 10

Answer: B

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38. If the acute angle between the pairs of lines $3x^2 - 7xy + 4y^2 = 0$ and $6x^2 - 5xy + y^2 = 0$ be θ_1 and θ_2 respectively, then

(A) $\theta_1 = \theta_2$

(B) $\theta_1 = 2\theta_2$

(C) $2\theta_1 = \theta_2$

(D) None of these

A. $\theta_1 = \theta_2$

B. $\theta_1 = 2\theta_2$

C. $2\theta_1 = \theta_2$

D. $\theta_1 = \frac{1}{2}\theta_2^2$

Answer: A

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39. The lines $a^2x^2 + bcy^2 = a(b+c)xy$ will be coincident , if

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

B. $a = b$ or $a = c$

C. $c = 0$ or $a = b$

D. $a = b + c$

Answer: A

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40. If the lines $(p-q)x^2+2(p+q)xy+(q-p)y^2=0$ are mutually perpendicular , then

A. $p=q$

B. $q=0$

C. $p=0$

D. p and q may have any value

Answer: D

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41. The two lines represented by $3ax^2 + 5xy + \left(a^2 - 2\right)y^2 = 0$ are perpendicular to each other for two values of a (b) a for one value of a (d) for no values of a

A. two values of a

B. $\forall$ a

C. one value of a

D. no value of a

Answer: A

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42. The angle between the lines given by the equation $\alpha y^2 + (1 - \alpha^2)xy - \alpha x^2 = 0$ is same as the angle between the lines

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

B. $5x^2 + 16xy + 5y^2 = 0$

C. $xy = 0$

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

Answer: C

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43. If the equation $ax^2 + ay^2 + 2gx + 2fy + c = 0$ represents a pair of lines then

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

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

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

D. $g^2 - f^2 = 0$

Answer: C

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44. If the equation $ax^2 + by^2 + cx + cy = 0$ represents a pair of straight lines , then

A. $a(b + c) = 0$

B. $b(c + a) = 0$

C. $c(a + b) = 0$

D. $a + b + c = 0$

Answer: C

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45. If the equation $hxy + gx + fy + c = 0$ represents a pair of straight lines, then

A. $fh = cg$

B. $fg = ch$

C. $h^2 = gf$

D. $fgh = c$

Answer: B

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

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

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

(A)$\frac{\pi}{2}$

(D) 0

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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47. If the angle between the pair of straight lines represented by the equation $x^2 - 3xy + \lambda y^2 + 3x - 5y + 2 = 0$ is $\tan^{-1} 3$, where λ is a non -negative real number, then $\lambda =$

A. 2

B. 0

C. 3

D. 1

Answer: A

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48. If the angle between the two lines given by $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ is $\frac{\pi}{4}$, then the contsntant a,b,h,g,f,c are related by

A. $a^2 + 6ab + 4b^2 = 4h^2$

B. $abc + 2fgh - af^2 - bg^2 - ch^2 = 0$

C. $a^2 - ab + b^2 = h^2$

D. $a^2 + 6ab + b^2 = 4h^2$

Answer: D

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49. The equation $x^2 - 3xy + \lambda y^2 + 3x - 5y + 2 = 0$ where λ is a real number, represents a pair of straight lines. If θ is the angle between the lines, then $\cos ec^2\theta =$

A. 3

B. 9

C. 10

D. 100

Answer: C

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50. Lines represented by $9x^2 + y^2 + 6xy - 4 = 0$ are

A. coincident

B. parallel but not coincident

C. not parallel

D. perpendicular

Answer: B

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51. The equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a circle if

A. $ag^2 = bf^2$

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

C. $bg^2 = af^2$

D. $b^2f = a^2f$

Answer: C

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52. Equation $x^2 + k_1y^2 + 2k_2y = a^2$ represents a pair of perpendicular straight lines if

A. $k_1 = 1, k_2 = a$

B. $k_1 = 1, k_2 = -a$

C. $k_1 = -1, k_2 = \pm a$

D. $k_1 = 1, k_2 = \pm a$

Answer: C

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53. The equation $\left(x^2 + y^2\right)\left(h^2 + k^2 - a^2\right) = (hx + ky)^2$ represents a pair of perpendicular lines if

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

B. $(h + k)(h - k) = 2a^2$

C. $h^2 + k^2 = a^2$

D. $h^2 + k^2 = 0$

Answer: A

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54. The equation $2x^2 + 4xy - py^2 + 4x + qy + 1 = 0$ will represent two mutually perpendicular straight lines , if

A. $p = 1$ and $q = 2$ or 6

B. $p = 2$ and $q = 0$ or 6

C. $p = 2$ and $q = 0$ or 8

D. $p = -2$ and $q = -2$ or 8

Answer: C

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55. If $12x^2 + 7xy + by^2 + gx + 7y - 1 = 0$ represents a pair of perpendicular lines then

A. $b = 12, g = 1$

B. $b = -12, g = 1$

C. $b = -12, g = -1$

D. $b = -12, g = -\frac{1}{2}$

Answer: C

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56. If the equation $12x^2 + 7xy - py^2 - 18x + qy + 6 = 0$ represents a pair of perpendicular straight lines, then

A. $-1, 2$

B. $1, \ -2$

C. $1, \ \frac{-23}{2}$

D. $-1, \ \frac{23}{2}$

Answer: C

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57. If two sides of a triangle are represented by $x^2 \_ 7xy + 6y^2 = 0$ and the centroid is $(1, 0)$ then the equation of third side is

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

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

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

D. $2x - 7y - 3 = 0$

Answer: D

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58. The lines $(lx + my)^2 - 3(mx - ly)^2 = 0$ and $lx + my + n = 0$ forms

A. an isosceles triangle

B. a right angled triangle

C. an equilateral triangle

D. an obtuse triangle

Answer: C

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Competitive Thinking

1. 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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2. The joint equation of pair of lins through origin, each of which makes an angles of 60° with Y-axis is

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

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

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

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

Answer: A

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3. The joint equation of lines passing through the origin and trisecting the first quadrant is

A. $x^2 + \sqrt{3}xy - y^2 = 0$

B. $x^2 - \sqrt{3}xy - y^2 = 0$

C. $\sqrt{3}x^2 - 4xy + \sqrt{3}y^2 = 0$

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

Answer: C

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4. The joint equation of bisectors of angles between lines $x = 5$ and $y = 3$ is

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

B. $x^2 - y^2 - 10x + 6y + 16 = 0$

C. $xy = 0$

D. $xy - 5x - 3y + 15 = 0$

Answer: B

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5. 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. $3x^2 - 3y^2 + 8xy + 20x + 10y + 25 = 0$

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

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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6. The equation $x^2 - 7xy - y^2 = 0$ represents

A. Circle

B. Pair of parallel straight lines

C. pair of perpendicular straight lines

D. Pair of non-perpendicular intersecting straight lines

Answer: D

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7. The equation $\sqrt{(x-2)^2+y^2}+\sqrt{(x+2)^2+y^2}=4$ represents

A. Circle

B. pair of straight lines

C. parabola

D. Ellipse

Answer: B

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8. Joint equation of pair of lines through $(3, -2)$ and parallel to $x^2 - 4xy + 3y^2 = 0$ is

A. $x^2 - 4xy + 3y^2 - 14x + 24y + 45 = 0$

B. $x^2 - 4xy - 3y^2 - 14x - 24y - 45 = 0$

C. $3x^2 + 4xy + y^2 + 14x - 24y - 45 = 0$

D. $3x^2 + 4xy + y^2 - 14x - 24y + 45 = 0$

Answer: A

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9. Combined equation of lines perpendicular to $5x^2 + 3xy - 2y^2 = 0$ is

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

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

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

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

Answer: B

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10. The equation to the pair of straight lines passing through $(2, 1)$ and perpendicular to the pair of lines $4xy + 2x + 6y + 3 = 0$ is

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

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

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

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

Answer: D

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11. O(0,0), A(1,2), B(3,4) are the vertices of ΔOAB. The joint equation of the altitude and median drawn from O is

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

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

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

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

Answer: D

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12. The equation to a pair of opposite sides of a parallelogram are $x^2 - 5x + 6 = 0$ and $y^2 + 5 = 0$. The equations to its diagonals are

$x + 4y = 13, y = 4x - 7$ (b) $4x + y = 13, 4y = x - 7$

$4x + y = 13, y = 4x - 7$ (d) $y - 4x = 13, y + 4x - 7$

A. $x + 4y = 13$ and $y = 4x - 7$

B. $4x + y = 13$ and $4y = 4x - 7$

C. $4x + y = 13$ and $y = 4x - 7$

D. $y - 4x = 13$ and $y + 4x = 7$

Answer: C

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13. If $2x^2 + 3xy - 2y^2 = 0$ represents two sides of a parallelgram and $3x + y + 1 = 0$ is one of its diagonals then the other diagonals is

A. $x - 3y + 1 = 0$

B. $x - 3y + 2 = 0$

C. $x - 3y = 0$

D. $3x - y = 0$

Answer: C

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14. If one of the lines represented by the equation $ax^2 + 2hxy + by^2 = 0$ be $y = mx$ then

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

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

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

D. $bm^2 - 2hm + a = 0$

Answer: A

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15. 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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16. If one of the lines given by $kx^2 - 5xy - 3y^2 = 0$ is perpendicular to the line $x - 2y + 3 = 0$, then k=

A. 2

B. $-\frac{11}{2}$

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

D. 3

Answer: A

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17. If one of the two lines $6x^2 + xy - y^2 = 0$ coincides with one of the two lines $3x^2 - axy + y^2 = 0$ ten

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

B. 1

C. 2

D. 4

Answer: A

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18. If the equation $ax^2 + 2hxy + by^2 = 0$ represented two lines $y = m_1x$ and $y = m_2x$ the

A. $m_1 + m_2 = \frac{-2h}{b}$ and $m_1m_2 = \frac{a}{b}$

B. $m_1 + m_2 = \frac{2h}{b}$ and $m_1m_2 = \frac{-a}{b}$

C. $m_1 + m_2 = \frac{2h}{b}$ and $m_1m_2 = \frac{a}{b}$

D. $m_1 + m_2 = \frac{2h}{b}$ and $m_1m_2 = -ab$

Answer: A

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19. The sum of the slopes of the lines given by $3x^2 + 5xy - 2y^2 = 0$ is

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

B. $-\frac{3}{2}$

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

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

Answer: A

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20. If the sum of slopes of the pair of lines represented by $4x^2 + 2hxy - 7y^2 = 0$ si equal to the product of the slopes, then the value of h is

A. -6

B. -2

C. -4

D. 4

Answer: B

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21. 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. -2

B. -1

C. 2

D. 1

Answer: C

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22. If the slope of one of the lines represented by $ax^2 + 6xy + y^2 = 0$ is twice the other, then a is equal to

A. 1

B. 2

C. 4

D. 8

Answer: D

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

A. ± 3

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

C. ± 2

D. ± 1

Answer: A

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24. If the slope of one of the lines given by $ax^2 + 2hxy + by^2 = 0$ is two times the other, then

A. $8h^2 = 9ab$

B. $8h^2 = 9ab^2$

C. $8h = 9ab$

D. $8h = 9ab^2$

Answer: A

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25. If slopes of lines represented by $kx^2 + 5xy + y^2 = 0$ differ by 1, then k=

A. 2

B. 3

C. 6

D. 8

Answer: C

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26. If the ratio of gradients of the line given by $ax^2 + 2hxy + by^2 = 0$ is $1:3$, then $h^2 : ab =$

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

B. $\frac{3}{4}$

C. $\frac{4}{3}$

D. 1

Answer: C

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27. if $\frac{X^2}{a}+\frac{y^2}{b}+\frac{2xy}{h}=0$ represent pair of straight lies and slope one line is twice the other line then $ab:h^2$.

A. $9:8$

B. $8:9$

C. $1:2$

D. $2:1$

Answer: A

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

A. 30°

B. 45°

C. 60°

D. None of these

Answer: C

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29. Acute angle between the lines represented by $\left(x^2+y^2\right)\sqrt{3}=4xy$ is

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{4}$

(C) $\frac{\pi}{3}$ (D) None of these

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

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

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

D. None of these

Answer: A

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30. The angle between the pair of straight lines $x^2 + 4y^2 - 7xy = 0$ is

A. $\tan^1\left(\frac{1}{3}\right)$

B. $\tan^{-1}(3)$

C. $\tan^{-1}\left(\frac{\sqrt{33}}{5}\right)$

D. $\tan^{-1}\left(\frac{\sqrt{33}}{10}\right)$

Answer: C

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31. The angles between the lines represented by the equation $4x^2 - 24xy + 11y^2 = 0$ are

A. $\tan^{-1}\frac{3}{4}, \tan^{-1}\left(-\frac{3}{4}\right)$

B. $\tan^{-1}\frac{1}{3}, \tan^{-1}\left(-\frac{1}{3}\right)$

C. $\tan^{-1}\frac{4}{3}, \tan^{-1}\left(-\frac{4}{3}\right)$

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

Answer: C

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32. The angle between the lines $x^2 + 2xy\sec\theta + y^2 = 0$ is

A. 2θ

B. 3θ

C. θ

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

Answer: C

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

A. equilateral triangle

B. right angled triangle

C. isosceles triangle

D. ordinary triangle with none of the above properties

Answer: A

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34. The lines represented by the equation $23x^2 - 48xy + 3y^2 = 0$ and $2x + 3y + 4 = 0$ form

A. an isosceles triangle

B. a right angled triangle

C. an equilateral triangle

D. a scalene triangle

Answer: C

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35. The nature of straight lines represented by the equation $4x^2 + 12xy + 9y^2 = 0$ is

A. Real and coincident

B. Real and different

C. Imaginary and different

D. None of the above

Answer: A

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36. The equation $x^2 + ky^2 + 4xy = 0$ represents two coincident lines if $k =$

A. 0

B. 1

C. 4

D. 16

Answer: C

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37. if lines represented by equation $px^2 - qy^2 = 0$ are distinct, then

A. $pq > 0$

B. $pq < 0$

C. $pq = 0$

D. $p + q = 0$

Answer: A

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

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

Answer: D

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39. Which of the following equation does not represent a pair of lines ?

A. $x^2 - x = 0$

B. $xy - x = 0$

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

D. $xy + xy + 1 = 0$

Answer: C

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40. The angle between the lines $3x^2 + 7xy + 2y^2 + 5x + 5y + 2 = 0$ is given by

A. Pair of straight line

B. Ellipse

C. Hyperbola

D. Circle

Answer: A

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41. The equation $xy + a^2 = a(x + y)$ represents

A. a parabola

B. a pair of straight lines

C. an ellipse

D. two parallel straight lines

Answer: B

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

A. -16

B. 16

C. 4

D. -4

Answer: B

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43. If the equation $kxy + 10x + 6y + 4 = 0$ represents a pair of lines then : $k =$

A. 0,18

B. 0,16

C. 0,15

D. 0,20

Answer: C

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44. The equation $x^2 + kxy + y^2 - 5x - 7y + 6 = 0$ represents a pair of straight lines, then k is

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

B. $\frac{10}{3}$

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

D. $\frac{3}{10}$

Answer: B

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45. The point of intersection of lines represented by $x^2 - y^2 + x + 3y - 2 = 0$ is

A. $(1, 0)$

B. $(0, 2)$

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

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

Answer: C

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46. If $2x^2 - 10xy + 2\lambda y^2 + 5x - 16y - 3 = 0$ represents a pair of straight lines, then point of intersection of those lines is

A. $(2, -3)$

B. $(5, -16)$

C. $\left(-10, \frac{-7}{2}\right)$

D. $\left(-10, \frac{-3}{2}\right)$

Answer: C

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47. Let L be the line joining the origin to the point of intersection of the lines represented by $2x^2 - 3xy - 2y^2 + 10x + 5y = 0$. If L is perpendicular to the line $kx + y + 3 = 0$ then $k =$

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

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

C. -1

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

Answer: B

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48. The line $5x + y - 1 = 0$ coincides with one of the lines given by $5x^2 + xy - kx - 2y + 2 = 0$, then the value of k is

A. -11

B. 31

C. 11

D. -31

Answer: C

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49. The angle between the lines $3x^2 + 7xy + 2y^2 + 5x + 5y + 2 = 0$ is given by

A. 0

B. $\pi / 2$

C. $\pi / 4$

D. $\pi / 6$

Answer: C

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50. The angle between the lines in $x^2 - xy - 6y^2 - 7x + 31y - 18 = 0$ is

A. 30°

B. 45°

C. 60°

D. 90°

Answer: B

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51. If the angle between the pair of straight lines represented by the equation $x^2 - 3xy + \lambda y^2 + 3x - 5y + 2 = 0$ is $\tan^{-1} 3$, where λ is a non -negative real number, then $\lambda =$

A. 2

B. 0

C. 3

D. 1

Answer: B

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52. If the angle between the two lines represented by $2x^2 + 5xy + 3y^2 + 6x + 7y + 4 = 0$ is $\tan^{-1}(m)$, then m is equal to

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

B. 1

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

D. 7

Answer: A

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53. The acute angle formed between the lines joining the origin to the points of intersection of the curves $x^2 + y^2 - 2x - 1 = 0$ and $x + y = 1$, is

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

B. $\tan^{-1} 2$

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

D. 60°

Answer: B

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54. The straight lines joining the origin to the points of intersection of the line $2x + y = 1$ and curve $3x^2 + 4xy - 4x + 1 = 0$ include an angle:

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

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

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

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

Answer: A

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55. If the lines joining the origin and the point of intersection of curves $ax^2 + 2hxy + by^2 + 2gx + 0$ and $a_1x^2 + 2h_1xy + b_1y^2 + 2g_1x = 0$ are mutually perpendicular, then prove that $g(a_1 + b_1) = g_1(a + b)$.

A. $ag + a_1g_1 = bg + b_1g_1$

B. $a + b = \mathrm{gg}_1(a_1 + b_1)$

C. $g(a_1 + b_1) = g_1(a + b)$

D. $g(a + b) = g_1(a_1 + b_1)$

Answer: C

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56. The pair of straight lines joining the origin to the points of intersection of the line $y = 2\sqrt{2x} + c$ and the circle $x^2 + y^2 = 21$ are at right angles , if

A. $c^2 - 4 = 0$

B. $c^2 - 8 = 0$

C. $c^2 - 9 = 0$

D. $c^2 - 10 = 0$

Answer: C

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57. The orthocenter of the triangle formed by the lines $x + y = 1$ and $2y^2 - xy - 6x^2 = 0$ is

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

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

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

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

Answer: A

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58. Joint equation of the diagonals of the square formed by the pairs of lines $xy + 4x - 3y - 12 = 0$ and $xy - 3x + 4y - 12 = 0$, is

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

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

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

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

Answer: C

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Evaluation Test

1. The combined equation of the line passing through origin and perpendicular to $2x^2 - 7xy - 15y^2 = 0$ is

A. $-15x^2 - 7xy + 2y^2 = 0$

B. $15x^2 + 13xy + 2y^2 = 0$

C. $15x^2 - 7xy - 2y^2 = 0$

D. $15x^2 - 13xy + 2y^2 = 0$

Answer: C

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2. If $4ab = 3h^2$, then the ratio of the slopes of the lines represented by the equation $ax^2 + 2hxy + by^2 = 0$ will be

(A) $\sqrt{2} : 1$

(B) $\sqrt{3} : 1$

(C) $2 : 1$

(D) $1 : 3$

A. $\sqrt{2} : 1$

B. $\sqrt{3} : 1$

C. $2 : 1$

D. $1 : 3$

Answer: D

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3. The equation $4x^2 + 12xy + 9y^2 + 2gx + 2fy + c = 0$ will represents two real partall straight lines. if

A. $g = 4, f = 9, c = 0$

B. $g = 2, f = 9, c = 1$

C. $g = 2, f = 3, c$ is any number

D. $g = 4, f = 9, c > 1$

Answer: C

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4. The value of λ for which the equation $x^2 - y^2 - x - \lambda y - 2 = 0$ represent a pair of straight line, are

A. $3, \ -3$

B. $-3, 1$

C. $3, 1$

D. $-1, 1$

Answer: A

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5. The acute angle between the lines represented by $x^2 + 2\sqrt{2}xy - y^2 = 0$ is

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

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

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

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

Answer: C

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

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

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

Answer: D

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7. The joint equation of the straight lines $x - y = 1$ and $2x + y = 6$ is

A. $2x^2 - y^2 - xy - 4x + 7y - 6 = 0$

B. $2x^2 - y^2 - xy - 8x + 5y + 6 = 0$

C. $2x^2 - y^2 - xy + 4x - 7y - 6 = 0$

D. $2x^2 - y^2 - xy + 8x - 5y + 6 = 0$

Answer: B

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8. If the equation $2x^2 + 2hxy + 3y^2 = 0$ has one line as bisector of angle between the co-ordinate axes, then $h =$

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

B. 5

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

D. 1

Answer: C

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9. If the equation $3x^2 - 2y^2 + \lambda xy - x + 5y - 2 = 0$ represents a pair of straight lines then $\lambda =$

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

B. 5

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

D. 1

Answer: B

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10. If one of the lines given by the equation $2z^2 + axy + 3y^2 = 0$ coincide with one of those given by $2x^2 + bxy - 3y^2 = 0$ and the other lines represented by them be perpendicular, then

A. $a = -5, b = 1$

B. $a = 5, b = -1$

C. $a = 5, b = 1$

D. None of these

Answer: C

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11. Acute angle between the lines represented by $3x^2 - 48xy + 23y^2 = 0$ is

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

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

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

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

Answer: A

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