



MATHS

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MATHS (KANNADA ENGLISH)

FAMILY OF LINES

Multiple Choice Question Level I

1. Area of the triangle formed by the lines $x+y=2$ and angle bisectors of the pair of st lines

$$x^2 + 2y = 1 \text{ is}$$

A. 2sq units

B. 4 sq units

C. 6 sq units

D. 8 sq units

Answer: A



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2. If 'a' is a parameter then the equation of family of lines having y intercept 4 is

A. $\frac{x}{a} - \frac{y}{4} = 1$

B. $\frac{x}{a} + \frac{y}{4} = 1$

C. $\frac{x}{a} - \frac{y}{4} - 1 = 0$

D. $\frac{x}{a} + \frac{y}{4} - 1 = 0$

Answer: B



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3. If k is a parameter then the equation of family of lines parallel to the line $3x+4y+5=0$ is

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

B. $3x-4y+k=0$

C. $3x+4y+k=0$

D. $4x+3y=0$

Answer: C



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4. If 'k' is parameter then the equation of family of lines perpendicular to the line $3x+4y+7-k=0$ is

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

B. $4x-3y+k=0$

C. $3x+4y+k=0$

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

Answer: B



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5. If k is parameter then the equation of family of lines passing through $(3,4)$ is

A. $kx - y - 4k = 0$

B. $kx - y - 3k + 4 = 0$

C. $kx + y - 3k + 4 = 0$

D. none of these

Answer: B



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6. If 'k' is a parameter then the equation of family of lines through the intersection of the lines

$x+2y=5$ and $x-3y=7$ is :

A. $(1+k)x-(2-3k)y-(5+7k)=0$

B. $(1+k)x+(2-3k)y-(5+7k)=0$

C. $(1+k)x-(2-3k)y+(5+7k)=0$

D. $(1+k)x+(2-3k)+(5+7k)=0$

Answer: B



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7. The equation of the straight line joining the origin to the point of intersection of $y-x+7=0$ and $y+2x-2=0$ is

A. $3x+4y=0$

B. $3x-4y=0$

C. $4x-3y=0$

D. $4x+3y=0$

Answer: D



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8. The equation of the straight line passing through the intersection of the lines $x-2y=1$ and $x+3y=2$ and parallel to $3x+4y=0$ is

A. $3x+4y+5=0$

B. $3x+4y-10=0$

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

D. $3x+4y+6=0$

Answer: C



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

A. a pair of straight lines

B. a circle

C. a parabola

D. an ellipse

Answer: A



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10. Angle between the lines

$$2x^2 - 7xy + 3y^2 = 0 \text{ is}$$

A. 60°

B. 45°

C. $\tan^{-1}\left(\frac{7}{6}\right)$

D. 30°

Answer: B



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11. The angle between the pair of straight lines

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

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

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

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

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

Answer: D



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

A. 1

B. 7

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

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

Answer: C



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13. The lines represented by the equation $Ax^2 + 2Bxy + Hy^2 = 0$ are perpendicular if

A. $A + H = 0$

B. $B + H = 0$

C. $AH = -1$

D. $A + B = 0$

Answer: A



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14. 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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15. If the slope of one of the lines represented by $ax^2 + 10xy + y^2 = 0$ is four times the slope of the other then

A. $a=1$

B. $a=4$

C. $a=8$

D. $a=16$

Answer: D



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

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

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

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

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

Answer: C



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17. If one of the lines $ax^2 + 2hxy + by^2 = 0$ bisects the angle between the axes 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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18. Area of the triangle formed by the lines

$$y^2 - 9xy + 18x^2 = 0 \text{ and } y = a \text{ is}$$

A. $\frac{27}{4}$

B. 0

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

D. $\frac{a^2}{12}$

Answer: D



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19. Orthocentre of the triangle formed by the lines $x+y+1=0$ and $2x^2 + y^2 + x + 2y - 1 = 0$ is

A. (0,1)

B. (-1,0)

C. (-1,1)

D. (1,1)

Answer: B



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20. 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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21. 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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22. Area of the triangle formed by the following lines : $y=|x|$ and $x+2y=2$ is

A. 4 sq units

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

C. $\frac{8}{3}$ sq units

D. $\frac{16}{3}$ sq units

Answer: B



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23. Area of triangle formed by :

$$2x^2 + xy - 3y^2 = 0 \text{ and } x+y=3 \text{ is}$$

A. $\frac{39}{4}$

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

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

D. $\frac{45}{4}$

Answer: D



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24. The difference of the tangents of the angles which the lines $x^2(\sec^2 \theta - \sin^2 \theta) - 2xy \tan \theta + y^2 \sin^2 \theta = 0$ makes with x axis is

- A. 2
- B. $2 \tan \theta$
- C. $\sin 2\theta$
- D. $2 \cot \theta$

Answer: A



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25. 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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26. If $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$

represents parallel lines then

A. $hf = bg$

B. $h^2 = bc$

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

D. none of these

Answer: A



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27. The equation

$$x^2 + (\lambda + \mu)xy + \lambda\mu y^2 + x + \mu y = 0$$

represent two parallel straight lines if

A. $\lambda + \mu = 0$

B. $\lambda = \mu$

C. $\lambda = 2\mu$

D. $\lambda = 4\mu$

Answer: B



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28. If the equation

$$12x^2 + 7xy - py^2 - 18x + qy + 6 = 0$$

represents a pair of perpendicular lines then

A. $p = 12, q = 1$

B. $p = -12, q = -1$

C. $p = 12, q = -1$

D. $p = -12, q = 1$

Answer: A



29. 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. $m^2 = 1$

B. $m^2 = 3$

C. $m^2 = 5$

D. $m^2 = 7$

Answer: D



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30. If the lines joining the origin to the points of intersection of the line $2x+y-1=0$ and the curve $3x^2 + \lambda xy - 4x + 1 = 0$ are at right angles then

A. $\lambda = -4$

B. $\lambda = 4$

C. $\lambda = 7$

D. all value of λ

Answer: D



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31. Area of the parallelogram formed by

$2x^2 + 5xy + 3y^2 = 0$ and

$2x^2 + 5xy + 3y^2 + 3x + 4y + 1 = 0$ is

A. 1

B. -1

C. 2

D. -2

Answer: A



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32. The quadrilateral by pairs of lines $xy+x+y+1=0$, $xy+3x+4y+9=0$ is

- A. a rectangle
- B. a square
- C. a parallelogram
- D. a rhombus

Answer: B



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33. If two lines represented by $ax^3 + bx^2y + cxy^2 + dy^3 = 0$ are at right angles then $a^2 + d^2 + ac + bd$ equals

A. 0

B. 1

C. -1

D. $ab+cd$

Answer: A



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34. The three lines represented by

$y^3 - 4x^2y = 0$ form a triangle which is

- A. isosceles
- B. equilateral
- C. right angled
- D. none of these

Answer: D



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35. 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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Multiple Choice Question Level Ii

1. If $4a^2 + 9b^2 - c^2 + 12ab=0$, then the family of straight lines $ax + by + c =0$ is concurrent at

A. (-2,3) or (2,-3)

B. (-2,3) or (-2,-3)

C. (2,3) or (2,-3)

D. (2,3) or (-2,-3)

Answer: D



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2. The distance between the parallel lines given by

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

A. 2

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

C. $4\sqrt{2}$

D. $8\sqrt{2}$

Answer: A



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3. The pair of st lines perpendicular to the pari

$ax^2 + 2hxy + by^2 = 0$ has the equation

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

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

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

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

Answer: D



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4. The equation $3x^2 + 2hxy + y^2 = 0$

represent a pair of st lines passing thro the origin the two lines are

A. real and distinct if $ht(2) > 3$

B. real and distinct if $h^2 > +9$

C. real and coincident if $h^2 = 7$

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

Answer: A



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5. 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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6. 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. $a+b=-2h$

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

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

Answer: B



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7. If the pairs of lines

$$3x^2 - 2pxy - 3y^2 = 0 \quad \text{and}$$

$$5x^2 - 2qxy - 5y^2 = 0$$

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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8. If pair of st lines

$$ax^2 + 2hxy - ay^2 = 0 \quad \text{and}$$

$$bx^2 + 2gxy - by^2 = 0 \quad \text{be such that each}$$

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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9. 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 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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10. If the pair of lines $ax^2 + 2hxy + by^2 = 0$ is rotated about the origin through 90° , 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. $bx^2 - 2hxy + ax^2 = 0$

Answer: D



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11. The equation of the image of the pair of lines $y = |x|$ by the line $x = 1$ is

A. $|y| + 2 = 0$

B. $|y| = x + 2$

C. $y = |1x - 2|$

D. $y = |x - 1|$

Answer: C



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12. If $x^2 - kxy + y^2 + 2y + 2 = 0$ represent a pair of st lines then k equals

A. 2

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

C. $2\sqrt{2}$

D. $\sqrt{2}$

Answer: D



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13. The equation

$$8x^2 + 8xy + 2y^2 + 26x + 13y + 15 = 0$$

represents a pair of parallel st lines the distance between them is :

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

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

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

D. none of these

Answer: B



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

A. $\frac{\sqrt{g^2 - ac}}{h^2 + a^2}$

B. $\frac{\sqrt{g^2 - ac}}{h^2 + a^2}$

C. $2 \frac{\sqrt{g^2 - ac}}{a(a + b)}$

D. $\frac{\sqrt{g^2 + ac}}{a(a + b)}$

Answer: C



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15. The lines joining the origin to the point of intersection of the curves

$$x^2 + y^2 + 2gx + c = 0 \quad \text{and}$$

$$x^2 + y^2 + 2fy - c = 0 \text{ are at right angles if}$$

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

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

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

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

Answer: D



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16. The lines joining the origin to the points of intersection of the curves

$$ax^2 + 2hxy + by^2 + 2gx = 0 \quad \text{and}$$

$$ax^2 + 2hxy + by^2 + 2gx = 0 \quad \text{are at right}$$

angles if

A. $a(h+g)=a(h+g)$

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

C. $g(a+b)=g(a+b)$

D. $g(a+b)=g(a+b)$

Answer: C



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17. 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 right angled triangle

D. none of these

Answer: C



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18. 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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19. If two of the lines $ax^3 + bx^2y + cxy^2 + dy^3 = 0$ make complementary angles with the x in anticlockwise sense then

A. $a(c-d)=b(b-c)$

B. $a(a-c)=d(d-b)$

C. $a(b-c)=d(a-b)$

D. $a(b-d)=c(c-d)$

Answer: B



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20. 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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21. A square is formed by following two pairs of straight lines $y^2 - 14y + 45 = 0$ and $x^2 - 8x + 12 = 0$. A circle is inscribed in it. The centre of the circle is

A. (7,4)

B. (4,7)

C. (3,7)

D. $\left(\frac{3}{8}, 4\right)$

Answer: B



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

A. 1

B. -1

C. 3

D. -3

Answer: D



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23. Out of two st lines represented by an equation $ax^2 + 2hxy + by^2 = 0$ if one will be $y = mx$ then other is :

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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24. The line parallel to the x axis and passing through the intersection of the lines

$$ax + 2by + 3b = 0 \text{ and } bx - 2ay - 3a = 0$$

where $(a,b) \neq (0,0)$ is

A. below the x axis at a distance of $\frac{2}{3}$ from

it

B. below the x axis at a distance of $\frac{3}{2}$ from

it

C. above the x axis at a distance of $\frac{2}{3}$ from
it

D. above the x axis at a distance of $\frac{3}{2}$ from
it

Answer: B



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25. If one of the lines of

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

is a bisector of the angle between the lines

$xy=0$ then m is

A. 2

B. 1

C. 2

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

Answer: B



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1. Locus of the image of the point (2,3) in the line $(2x-3y+4)+k(x-2y+3)=0$, $k \in \mathbb{R}$ is a

A. straight line parallel to x axis

B. straight line parallel to y axis

C. circle of radius $\sqrt{2}$

D. circle of radius $\sqrt{3}$

Answer: C



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Question From Karnataka Cet Comed

1. If m is the slope of one of the lines represented by

$$ax^2 + 2hxy + by^2 = 0 \text{ then } (h + bm)^2 =$$

A. $h^2 - ab$

B. $h^2 + ab$

C. $(a - b)^2$

D. $(a + b)^2$

Answer: A



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2. The perpendicular distance between the lines

$$9x^2 - 24xy + 16y^2 + 21x - 28y + 10 = 0 \text{ is}$$

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

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

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

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

Answer: B



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3. If the line $6x - 7y + 8 + \lambda(3x - y + 5) = 0$ is parallel to y-axis, then $\lambda =$

A. -7

B. -2

C. 7

D. 2

Answer: A



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

$$ax^2 + 2hxy + by^2 = 0 \text{ then}$$

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

B. $ap^2 + 2hpq + bp^2 = 0$

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

D. none of these

Answer: C



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5. Let a and b non zero reals such that $a \neq b$ then the equation of the line passing through the origin and the point of intersection of

$$\frac{x}{a} + \frac{y}{b} = 1 \text{ and } \frac{x}{b} + \frac{y}{a} = 1 \text{ is}$$

A. $ax+by=0$

B. $bx+ay=0$

C. $y-x=0$

D. $x+y=0$

Answer: C



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