MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

THE STRAIGHT LINES

Solved Examples And Exercises

1. Show that the straight lines given by $(2+k)x+(1+k)y=5+7k$ for different values of k pass through a fixed point. Also, find that point.

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2. Find the equation of the internal bisector of angle BAC of the triangle ABC whose vertices A, B, C are$(5,2)$, $(2,3)and(6,5)$ respectively.

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3. In what ratio, the line joining $(-1, 1) and (5, 7)$ is divided by the line $x + y = 4$?

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4. The mid points of the sides of a triangle are (2,1), (-5,7) and (-5,-5).The equation of sides are

: $(A) x - 2 = 0$

$(B) 6x + 7y + 65 = 0$

$(C) 6x - 7y + 79 = 0$

(D) All of these

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5. Find the equation of the altitudes of the triangle whose vertices are $A(7, -1), B(-2, 8) and C(1, 2)$.

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6. One side of a square makes an angle α with x axis and one vertex of the square is at origin. Prote that the equations of its diagonals are $x(\sin\alpha+\cos\alpha)=y(\cos\alpha-\sin\alpha)$ or $x(\cos\alpha-\sin\alpha)+y(\sin\alpha+\cos\alpha)=a$, where a is the length of the side of the square.

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7. Show that the perpendicular drawn from the point $(4,1)$ on the line segment joining $(6,5)and(2,-1)$ divides it internally in the ratio $8:5$.

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8. Prove that the perpendicular drawn from the point $(4,1)$ on the join of $(2,-1)and(6,5)$ divides it in the ratio $5:8$.

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9. A line passing through the point $A(2, 0)$ makes 30^0 angle with the positive direction of $x - a\xi s$. If this line is rotated through an angle of 15^0 in clockwise direction, find its equation in new position.

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10. In what ratio is the line joining the points $(2, 3) and (4, 1)$ divides the segment joining the points $(1, 2) and (4, 3)$?

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11. Find the equations to the altitudes of the triangle whose angular points are $A(2, -2), B(1, 1)$ and $C(-1, 0)$.

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12. Find the equations of the diagonals of the square formed by the lines $x = 0, y = 0, x = 1$ and $y = 1$.

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13. Find the equation of a line which cuts off intercepts a and b respectively from the x and $y - axes$ is $\frac{x}{a} + \frac{y}{b} = 1$

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14. Find the equation of the bisector of angle A ofthe triangle whoe vertices are $A(4, 3), B(0, 0) and C(2, 3)$.

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15. Find the equations the straight lines which go through the origin and trisect the portion of the straight line $3x + y = 12$ which is intercepted

beteen the axes of coordinates.

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16. A line is such that its segment between the lines $5x \quad y + 4 = 0$ and $3x + 4y \quad 4 = 0$ is bisected at the point (1, 5). Obtain its equation.

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17. Find the equations to the diagonals of the rectangle the equations of whose sides are $x = a, x = a', y = bandy = b'$

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18. A rectangle has two opposite vertices at the points $(1, 2)and(5, 5)$. If the other vertices lie on the line $x = 3$, find the equations of the sides of the rectangle.

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19. Find the coordinates of the vertices of a square inscribed in the triangle with vertices $A(0,0), B(3,0) and C(2,1);$ given that two of its vertices are on the side AB.

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20. If the intercept of a line between the coordinate axes is divided by the point $(-5,4)$ in the ratio $1:2,$ then find the equation of the line.

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21. A straight line moves so that the sum of the reciprocals of its intercepts made on axes is constant. Show that the line passes through a fixed point.

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22. Find the equations of lines parallel to $3x - 4y - 5 = 0$ at a unit distance from it.

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23. If the length of the perpendicular from the point $(1, 1)$ to the line $ax - by + c = 0$ be unity, show that $\frac{1}{c} + \frac{1}{a} - \frac{1}{b} = \frac{c}{2ab}$

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24. If t_1 and t_2 are roots of eth equation $t^2 + \lambda t + 1 = 0$, where λ is an arbitrary constant. Then prove that the line joining the points $(at_1, 22at_1)$ and $(at_2, 22at_2)$ always passes through a fixed point. Also, find the point.

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25. Show that the locus of the mid-point of the segment intercepted between the axes of the variable line $x\cos\alpha + y\sin\alpha = p$ then $\frac{1}{x^2} + \frac{1}{y^2} = \frac{4}{p^2}$, where p is a constant.

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26. Find the equation of the line which passes through $P(1, -7)$ and meets the axes at $AandB$ respectively so that $4AP - 3BP = 0$.

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27. The area of the triangle formed by the coordinates axes and a line is 6 square unit length of d a line is 6 square units a tie'hypotenuse is 5 units. Find the equation of the line.

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28. Find the equations of the line which passes through the point $(3, 4)$ and the sum of its intercepts on the axes is14 .

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29. For what values of a and b the intercepts cut off n the coordinate axes by the line $ax + by + 8 = 0$ are equal in length but opposite in signs to those cut off by the line $2x - 3y + 6 = 0$ on the axes.

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30. Find the equation of the straight line which passes though $(1, -3)$ and cuts off equal intercepts on the axes.

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31. If the line $\left(\frac{x}{a}\right)+\left(\frac{y}{b}\right)=1$ moves in such a way that $\left(\frac{1}{a^2}\right)+\left(\frac{1}{b^2}\right)=\left(\frac{1}{c^2}\right)$, where c is a constant, prove that the foot of the perpendicular from the origin on the straight line describes the circle $x^2+y^2=c^2$.

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32. If the sum of the distances of a moving point in a plane from the axes is 1, then find the locus of the point.

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33. Find the equation of the straight lines each of which passes through the point $(3,2)$ and cuts off intercepts $aandb$ respectively on $xandy-axes$ such that $a-b=2$.

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34. The equation of straight line which passes through the point (-4,3) such that the portion of the line between the axes is divided by the point in ratio 5:3 is -

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35. Prove that the length of perpendiculars from points $P\left(m^2, 2m\right) Q(mn, m+n) and R\left(n^2, 2n\right)$ to the line $x\cos^2\theta + y\sin\theta\cos\theta + \sin^2\theta = 0$ are in G.P.

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36. The equation of the base of an equilateral triangle is $x + y - 2 = 0$ and the opposite vertex his coordinates (2, -1). Find the length of side of the triangle.

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37. Find the equations of lines passing through the point $(1, 0)$ and a distance $\frac{\sqrt{3}}{2}$ from the origin.

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38. Find the coordinates of a point on $x + y + 3 = 0$, whose distance from $x + 2y + 2 = 0$ is $\sqrt{5}$.

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39. A point moves such teat its distance from the point $(4, 0)$ is half that of its distance from the line $x = 16$, find its locus.

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40. Find the locus of a point which moves in such away that the square of its distance from the point $(3, -2)$ is numerically equal to its distance

from the line $5x - 12y = 13$.

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41. Find the equation of the straight line on which the length of the perpendicular from the origin is 4 units and the line makes an angle of 120^0 with positive direction of $x - a\xi s\cdot$

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42. Find the equation of the straight line upon which the length of the perpendicular from the origin is $5and$ the slope of this perpendicular is $\frac{3}{4}\cdot$

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43. A line forms a triangle of area $54\sqrt{3}square$ units with the coordinate axes. Find the equation of the line if the perpendicular drawn from the

origin to the line makes an angle of 60^0 with the X-axis.

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44. A straight canal is $4\frac{1}{2}miles$ from a place and the shortest route from this place to the canal is exactly north-east. A village is $3miles$ north and four miles east from the place. Does it lie by the nearest edge of the canal?

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45. Find the equation of the line on which the length of the perpendicular segment from the origin to the line is 4 and the inclination of the perpendicular segment with the positive direction of x-axis is 30^0.

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46. Find the equation of the straight line on which the length of the perpendicular from the origin is 2 and the perpendicular makes an angle α with x-axis such that $\sin\alpha = \frac{1}{3}$.

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47. Find the equation of a straight line on which the perpendicular from the origin makes an angle of 30^0 with x-axis and which forms a triangle of area $50\sqrt{3}$ with the axes.

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48. The slope of a straight line through $A(3,2)$i s $3/4$ Find the coordinates of the points on the line that are $5units$ away from$A$.

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49. Find the equation of the line through the point $A(2, 3)$ and making an angle an angle of 45^0 with the $x - a\xi s$. Also, determine the length of intercept on it between $Aand$ the line $x + y + 1 = 0$.

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50. If the straight line through the point (3,4) makes an angle $\frac{\pi}{6}$ with x-axis and meets the line $12x + 5y + 10 = 0$ at Q, Then the length of PQ is :

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51. The angle between the diagonals of a quadrilateral formed by the lines $\frac{x}{a} + \frac{y}{b} = 1, \frac{x}{b} - \frac{y}{a} = 1,$ is

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52. Find the equation of two straight lines which are parallel to $x + 7y + 2 = 0$ and at unit distance from the point $(1, -1)$.

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53. Show that the lines $4x + y - 9 = 0, x - 2y + 3 = 0, 5x - y - 6 = 0$ make equal intercepts on any line of slope 2.

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54. Find the value of m for which the lines $mx + (2m + 3)y + m + 6 = 0$ and $mx + (2m + 1)x + (m - 6)y + 9 = 0$ intersect at a; point on y-axis .

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55. The sides $ABandAC$ of a triangle ABC are respectively $2x+3y=29andx+2y=16$ respectively. If the mid-point of $BCis(5,6)$ then find the equation of BC.

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56. A line through $A(-5,-4)$ meets the lines $x+3y+2=0, 2x+y+4=0andx-y-5=0$ at the points $B, CandD$ rspectively, if $\left(\frac{15}{AB}\right)^2+\left(\frac{10}{AC}\right)^2=\left(\frac{6}{AD}\right)^2$ find the equation of the line.

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57. Explain BPT Theorem

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58. Transform the equation of the line $\sqrt{3}x + y - 8 = 0$ to (i) slope intercept form and find its slope and y-intercept (ii) intercept form and find intercepts in the coordinates axes (iii) normal form and find the inclination of the perpendicular segment from the origin on the line with the axis and its length.

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59. Find the distance of the point $(2, 3)$ from the lilne $2x - 3y + 9 = 0$ measured along a line $x - y + 1 = 0$.

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60. The line joining two points A(2,0) and B(3,1) is rotated about A in anticlockwise direction through an angle of 15°. find the equation of line in the new position. If b goes to c in the new position what will be the coordinates of C.

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61. Find the direction in which a straight line must be drawn through the point $(1, \quad 2)$ so that its point of intersection with the line $x \quad + \quad y \qquad 4$ may be at a distance of 3 units from this point.

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62. Show that the equations of the straight lines passing through the point $(3, \ -2)$ and inclined at 60° to the line $\sqrt{3}x + y = 1$ a r e $y + 2 = 0$ and $y - \sqrt{3}x + \left(2 + 3\sqrt{3}\right) = 0.$

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63. A vertex of an equilateral triangle is $(2, 3)$ and the opposite side is $x + y = 2$. Find the equations of other sides.

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64. Find the value of λ , if the line $3x - 4y - 13 = 0, 8x - 11y - 33 = 0$ a n d $2x - 3y + \lambda = 0$ are concurrent.

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65. If the lines $ax + y + 1 = 0, x + by + 1 = 0$ and $x + y + c = 0$ are concurrent $(a \neq b \neq c \neq 1)$, prove that $\frac{1}{1-a} + \frac{1}{1-b} + \frac{1}{1-c} = 1$.

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66. If the straight line $\frac{x}{a} + \frac{y}{b} = 1$ passes through the line point of intersection of the lines $x + y = 3$and $2x - 3y = 1$ and is parallel to $x - y - 6 = 0$, find a and b

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67. Find the orthocentre of the triangle the equations of whose sides are $x + y = 1, 2x + 3y = 6$and $4x - y + 4 = 0.$

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68. Two vertices of a triangle are $(3, -1)$ and $(-2, 3)$ and its orthocenter is at the origin,. Find the coordinates of its third vertex.

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69. Two consecutive sides of a parallelogram are $4x + 5y = 0adn7x + 2y = 0.$ If the equation of one diagonal is $11x + 7y = 9,$ Equation of other diagonal : (A) $11x + 7y = 0$ (B) $3x - 5y + 5 = 0$ (C) $7x + 11y = 0$ (D) $3x + 5y + 5 = 0$

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70. Find the equation of the straight line passing through the point of intersection of the lines $5x - 6y - 1 = 0 and 3x + 2y + 5 = 0$ and perpendicular to the line $3x - 5y + 11 = 0$.

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71. Show that the line $x - y - 6 = 0, 4x - 3y - 20 = 0$ and $6x + 5y + 8 = 0$ are concurrent. Also, find their common point of intersection.

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72. Three sides $AB, AC and CA$ of triangle ABC are $5x - 3y + 2 = 0, x - 3y - 2 = 0 and x + y - 6 = 0$ respectively. Find the equation of the altitude through the vertex A.

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73. Find the coordinates of the in centre and centroid of the triangle whose sides have the equations $3x - 4y = 0, 12y + 5x = 0$ and $y - 15 = 0$.

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74. Show that the straight lines given by $x(a + 2b) + y(a + 3b) = a$ for different values of a and b pass through a fixed point.

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75. If a, b, c are variables such that $3a + 2b + 4c = 0$, then show that the family of lines givenby $ax + by + c = 0$ pass through a fixed point. Also, find that point.

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76. If the algebraic sum of the perpendiculars from the points $(2, 0), (0, 2), (1, 1)$ to a variable line be zero, then prove that line passes through a fixed-point whose coordinates are $(1, 1)$.

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77. A ray of light is sent along the line $x - 2y - 3 = 0$ upon reaching the line $3x - 2y - 5 = 0$, the ray is reflected from it. Find the equation of the line containing the reflected ray.

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78. lines $L_1 : ax + by + c = 0$ and $L_2 : lx + my + n = 0$ intersect at the point P and make a angle θ between each other. find the equation of a line Ldifferent from L_2 which passes through P and makes the same angle θ with L_1

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79. Find the equation of the straight line passing through the point of intersection of $2x + 3y + 1 = 0$an d $3x - 5y - 5 = 0$ and equally inclined to the axes.

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80. Find the equation of the straight line which cuts off intercept on X-axis which is twice that on Y-axis and is at a unit distance from the origin.

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81. Find the equation of the straight line passing through the point of intersection of $2x + y - 1 = 0adnx + 3y - 2 = 0$ and making with the coordinate axes a triangle of area 3/8 sq. units.

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82. Find the equations of the lines through the point of intersection of the lines $x - y + 1 = 0$ and$2x - 3y + 5 = 0$whose distance from the point$(3, 2)$ is $\frac{7}{5}$

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83. Write the area of the figure formed by the lines $a|x| + b|y| + c = 0$.

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84. If θ is the acute angle between the lines with slopes m1 and m2 then $\tan\theta = \frac{m_1 - m_2}{1 + m_1 m_2}$.

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85. A straight line L is perpendicular to the line $5x - y = 1$. The area of the triangle formed by the line L and the coordinate axes is

$5 squareunits$. Find the equation of the line L.

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86. Find the image of the point $(-8, 12)$ with respect to line mirror $4x + 7y + 13 = 0$.

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87. Show that the equation of a line passing through $(a\cos 3\theta, a\sin^3\theta)$ and perpendicualar to the line $x\sec\theta + y\operatorname{cosec}\theta = a is x\cos\theta - y\sin\theta - a\cos 2\theta$.

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88. Find the equation of a straight line parallel to $2x + 3 + 11 = 0$ and which is such that the sum of its intercepts on the axes is 15.

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89. Find the coordinates of the foot of the perpendicular drawn from the point $(1, -2)$ on the line $y = 2x + 1$.

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90. If the lines $p_1x + q_1y = 1, p_2x + q_2y = 1 and p_3x + q_3y = 1,$ be concurrent, show that the point $(p_1, q_1), (p_2, q_2) and (p_3, q_3)$ are collinear.

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91. Prove that the medians of a triangle are concurrent and find the position vector of the point of concurrency (that is, the centroid of the triangle)

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92. Show that the altitudes of a triangle are concurrent

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93. Two sides of an isosceles triangle are given by the equations $7x - y + 3 = 0$ and $x + y - 3 = 0$ and its third side passes through the point $(1, -1)$. Determine the equation of the third side.

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94. Let $P(x_1, y_1)$ be a point and let $ax + by + c = 0$ be a line. If $L(h, k)$ is the foot of perpendicular drawn from P on this line and $Q(\alpha, \beta)$ is the image of P in the given line, then prove that

(i) $\frac{h - x1}{a} = \frac{k - y1}{b} = -\frac{ax_1 + by_1 + c}{a^2 + b^2}$.

(ii) $\frac{\alpha - x}{a} = \frac{\beta - y}{b} = 2\frac{ax_1 + by_1 + c}{a^2 + b^2}$.

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95. Find the equations the sides of an isosceles right angled triangle the equation of whose hypotenuse is $3x + 4y = 4$ and the opposite vertex is the point (2, 2).

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96. A line $4x + y = 1$ passes through the point A(2,-7) and meets line BC at B whose equation is $3x - 4y + 1 = 0$, the equation of line AC such that $AB = AC$ is (a) 52x +89y +519=0(b) 52x +89y-519=0 c) 82x +52y+519=0 (d) 89x +52y -519=0

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97. One side of a rectangle lies along the line $4x + 7y + 5 = 0$. Two of its vertices are $(-3, 1) and (1, 1)$. Find the equations of the other three sides.

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98. If two opposite vertices of square are (1,2) and (5.8), find the coordinates of its other two vertices and the equations of its sides.

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99. Find the equation of the straight line which passes through the intersection of the lines $x-y-1=0 and 2x-3y+1=0$ and parallel (i) x-axis(i i)y-axis(i i i)3x+4y=14.

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100. Find the equation of the straight line which passes through the point $(2, -3)$ and the point intersection of the lines $x+y+4=0 and 3x-y-8=0.$

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101. If $A(2, 0), B(0, 2) and C(0, 7)$ are three vertices, taken in order, of an isosceles trapezium $ABCD$ in which $AB \mid\mid DC$. find the coordinates of D.

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102. Prove that the line joining the mid-points of the two sides of a triangle is parallel to the third side.

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103. A ray of light passing through the point $(1, 2)$ reflects on the x-axis at point A and the reflected ray passes through the point $(5, 3)$. Find the co-ordinates of A.

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104. Prove that $A(4, 3), B(6, 4) and C(5, 6) and D(3, 5)$ are the angular points of a square.

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105. What is the value of y so that the line through $(3, y) and (2, 7)$ is parallel to the line through $(-1, 4) and (0, 6)$?

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106. Let $A(6, 4) and B(2, 12)$ be two given points. Find the slope of a line perpendicular to AB.

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107. Find the angle between the lines joining the point $(0, 0), (2, 3)$ and the points $(2, -2), (3, 5)$.

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108. Determine x so that the line passing through $(3, 4) and (x, 5)$ makes an angle of 135° angle with positive direction of x-axis

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109. If $A(-2, 1), B(2, 3) and C(-2, -4)$ are three points, find the angle between $AB and BC$.

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110. Find the equation of a straight line which passes through the point of intersection of the straight lines $x + y - 5 = 0$ and $x - y + 3 = 0$ and perpendicular to a straight line intersecting x-axis at the point (-2,0) and the y-axis at the point (0,-3).

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111. Classify the following pairs of lines as coincident, parallel or intersecting:

$x + 2y - 3 = 0 \text{and} -3x - 6y + 9 = 0$

$x + 2y + 1 = 0 \text{and} 2x - 4y + 3 = 0$

$3x - 2y + 5 = 0 \text{and} 2x + y - 9 = 0$

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112. Find the slope of the lines which make an angle of 45^0 with the line $3x - y + 5 = 0.$

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113. . The lines $(a + b)x + (a - b)y - 2ab = 0, (a - b)x + (a + b)y - 2ab = 0$ and $x + y$ form an isosceles triangle whose vertical angle is

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114. If the point as $(4, 7)$ and $(\cos\theta, \sin\theta)$, where $0 < \theta < \pi$, lie on the same side of the line $x + y - 1 = 0,$ then prove that θ lies in the first quadrant.

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115. Find the centroid, incentre circum-centre and orthocentre of the triangle whosesie the equations $3x - 4y = 0, 12y + 5x = 0$ and $y - 15 = 0$

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116. The vertices of a triangle are $[at_1t_2, a(t_1 + t_2)]$, $[at_2t_3, a(t_2 + t_3)]$, $[at_3t_1, a(t_3 + t_1)]$ Then the orthocenter of the triangle is (a) $(-a, a(t_1 + t_2 + t_3) - at_1t_2t_3)$ (b) $(-a, a(t_1 + t_2 + t_3) + at_1t_2t_3)$ (c) $(a, a(t_1 + t_2 + t_3) + at_1t_2t_3)$ (d) $(a, a(t_1 + t_2 + t_3) - at_1t_2t_3)$

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117. Find the tangent of the angle between the lines whose intercepts on the axes are respectively $a, -b$ and $b, -a$

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118. Find the value of k if the straight line $2x + 3y + 4 + k(6x - y + 12) = 0$ is perpendicular to the line $7x + 5y - 4 = 0.$

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119. Find the values of β so that the point $(0, \beta)$ lies on or inside the triangle havind the sides $3x + y + 2 = 0, 2x - 3y + 5 = 0 and x + 4y - 14 = 0.$

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120. Find the values of α so that the point $P(\alpha^2, \alpha)$ lies inside or on the triangle formed by the lines $x - 5y + 6 = 0, x - 3 + 2 = 0 and x - 2y - 3 = 0.$

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121. Find the ratio in which the line $3x + 4y + 2 = 0$ divides the distance between the lines $3x + 4y + 5 = 0 and 3x + 4y - 5 = 0.$

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122. Prove that the area of the parallelogram formed by the lines $x \cos \alpha + y \sin \alpha = p, x \cos \alpha + ys \in \alpha = q, x \cos \beta + y \sin \beta = r and x \cos$

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123. Find the equation of the perpendicular bisector of the line segment joining the points $A(2, 3) and B(6, -5)$.

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124. The vertices of a triangle are $A(10, 4), B(-4, 0) and C(-2, 8)$. Find the equation of its altitudes. Also, find its orthocentre.

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125. Two sides of a square lie on the lines $x + y = 1 and x + y + 2 = 0$. What is its area?

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126. Prove that the line $5x - 2y - 1 = 0$ is mid-parallel ot the lines $5x - 2y - 9 = 0 and 5x - 2y + 7 = 0$.

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127. Find the equation of a line that has y - intercept 4 and is perpendicular to the line joining $(2, -3) and (4, 2)$.

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128. P_1, P_2 are points on either of the two line $y - \sqrt{2}|x| = 2$ at a distance of 5 units from their point intersection. Find the coordinatesof the foot of perpendiculars drawn from P_1, P_2 on the bisector of the angle between the given lines.

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129. Find the equation of a line has y-intercept is -4 and is parallel to the line joining $(2, -5) and (1, 2)$.

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130. Find the equation of a line passing through $(1, 2)$ and making angle of 30^0 with y-axis .

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131. The vertices of a triangle are $A(x_1, x_1\tan\theta_1), B(x_2, x_2\tan\theta_2) and C(x_3, x_3\tan\theta_3)$. if the circumcentre of ΔABC coincides with the origin and $H(\bar{x}, \bar{y})$ is the orthocentre, show that $\frac{\bar{y}}{\bar{x}} = \frac{\sin\theta 1 + \sin\theta_2 + \sin\theta_3}{\cos\theta_1 + \cos\theta_2 + \cos\theta_3}$

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132. Find the equation of a line which is parallel to $y-$ axis and passes through $(-4, 3)$.

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133. Find the equation of a line which is equidistant from the lines $x = -4$ and $x = 8$

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134. Find the equation of a straight line which makes an angle of $\tan^{-1}\sqrt{2}$ with the x-axis and cuts off an intercept of $= \frac{3}{\sqrt{2}}$ with the y-axis

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135. The equation of the base of an equilateral triangle is $x + y = 2$ and its vertex is $(2, -1)$. Find the length and equations of its sides.

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136. find the slope of a line whose inclination to the positive directioin of x-axis in anticlockwise sense is i. 60° ii.0° iii. 150° iv. 120°

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137. What can be said regarding a line if its slope is i. positive ii. zero iii negative?

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138. Find the slope of a line which passes through points (3,2) and (-1,5).

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139. Determine x so that 2 is the slope of the line through (2,5) and $(x, 3)$.

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140. Without using Pythagoras theorem, show that $A(4, 4),\ B(3, 5) and\ C(-1, -1)$ are the vertices of a right angled triangle.

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141. A quadrilateral has the vertices at the points $(-4, 2),\ (2, 6),\ (8, 5)\ and\ (9, -7)$. Show that the mid points of the sides of this quadrilateral are the vertices of a parallelogram.

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142. If the points $P(h, k),\ Q(x_1, y_1) and\ R(x_2, y_2)$ lie on a line. Show that: $(h - x_1)(y_2 - y_1) = (k - y_1)(x_2 - x_1)$.

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143. In figure, time and distance graph of a linear motion is given. Two positions of time and distance recorded and when $T = 0,\ D = 2\ and\ when\ T = 3,\ D = 8.$ Using the concept of slope, find law of motion i.e. how distance depends upon time.

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144. If points $(a, 0),\ (0, b) and\ (x, y)$ are collinear, using the concept of slope prove that $\frac{x}{a} + \frac{y}{b} = 1.$

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145. By using the concept of slope, prove that the diagonals of a rhombus are at right angles.

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146. Using the concept of slope, prove that medians of an equilateral triangle are perpendicular to the corresponding sides.

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147. Prove that that a triangle which has one of the angle as 30^0 cannot have all vertices with integral coordinates.

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148. Find the slopes of the lines which make the following angles with the positive direction of x-axis: $\frac{\pi}{4}$ ii. $\frac{2\pi}{3}$

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149. Find the slopes of the lines which make the following angles with the positive direction of x-axis: $\frac{3\pi}{4}$ ii. $\frac{\pi}{3}$

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150. Find the slope of a line passing through the following point: $(-3, 2) and (1, 4)$

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151. Find the slope of a line passing through the following point: $(at_1^2, 2at_1) and (at_2^2, 2at_2)$

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152. Find the slope of a line passing through the following point: $(3, -5) and (1, 2)$.

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153. State whether the tow lines in each of the following are parallel, perpendicular or nether: through (9,5) and (-1,1); through (3,-5) and (8,-3)

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154. State whether the two lines in each of the following are parallel, perpendicular or neither: through (5,6) and (2,3); through (9,-2) and (6,-5)

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155. State whether the two lines in each of the following are parallel, perpendicular or neither: through (6,3) and (1,1); through (-2,5) and (2,-5)

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156. State whether the two lines in each of the following are parallel, perpendicular or neither: through (3,15) and (16,6); through (-5,3) and (8,2)

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157. Find the slope of a line i. which bisects the first quadrant angle ii. which makes an angle of 30^0 with the positive direction of y-axis measured anticlockwise.

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158. Using the method of slope, show that the following points are collinear: $A(4, 8),\ B(5, 12),\ C(9, 28)$

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159. Using the method of slope, show that the following points are collinear: $A(16,\ -18),\ B(3,\ -6),\ C(-10, 6)$

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160. What is the value of y so that the line through $(3, y) and (2, 7)$ is parallel to the line through $(-1, 4) and (0, 6)$?

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161. What can be said regarding a line if its slope is i. positive ii. zero iii negative?

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162. Show that the line joining (2,-3) and (-5,1) is parallel to the line joining (7,-1) and (0,3).

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163. Show that the joining (2,-5) and (-2, 5) is perpendicular to the line joining (6,3) and (1,1).

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164. Without using Pythagoras theorem, show that the points $A(0, 4),\ B(1, 2) and\ C(3, 3)$ are the vertices of a right angled triangle.

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165. Prove that the points (-4, -1), (-2, -4), (4,0) and (2,3) are the vertices of a rectangle.

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166. If three points $A(h, 0),\ P(a, b) and\ B(0, k)$ lie on a line, show that: $\frac{a}{h} + \frac{b}{k} = 1.$

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167. The slope of a line is double of the slope of another line. If tangent of the angle between them is $\frac{1}{3}$, find the slopes of the lines.

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168. Consider the following population and year graph: find the slope of the line AB and using it find what will be the population in the year 2010.

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169. Without using distance formula, show that points $(2, \quad 1)$, $(4, \quad 0)$, $(3, \quad 3)$ and $(3, \quad 2)$ are the vertices of a parallelogram.

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170. Find the angle between the X-axis and the line joining the points $(3, \ -1) and \ (4, \ -2)$.

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171. Line through the points (-2,6) and (4,80 is perpendicular to the line through the points (8,12) and $(x, 24)$. Find the value of x.

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172. Find the value of x for which the points $(x-1),\ (2,1) and\ (4,5)$ are collinear.

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173. Find the angle between X-axis an the line joining the points (-3,-1) and (4,-2).

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174. By using the concept of slope, show that the points (-2,-1), (4,0), (3,3) and (-3,2) are the vertices of a parallelogram.

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175. A quadrilateral has vertices $(4, 1), (1, 7), (-6, 0)$ AND $(-1, -9)$. Show that mid-points of the sides of this quadrilateral form a parallelogram.

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176. Write down the equation of the following lines: x-axis

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177. Write down the equation of the following lines: $y - a\xi s$

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178. Write down the equation of the following lines: A line parallel to x-axis at a distance of 3 units below x-axis.

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179. Write down the equation of the following lines: a line parallel to y-axis at a distance of 5 units on the left hand side of it.

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180. Find the equation of a line which is parallel to x-axis and passes through (3,-5).

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181. Find the equation of the line parallel to x-axis and passing through (3,-5).

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182. Find the equation of the line perpendicular to x-axis and having intercept -2 on x-axis.

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183. Find the equation of the line parallel to x-axis of and having intercept -2 on y-axis.

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184. Find the equation of the line parallel to x-axis of and having intercept -2 on y-axis.

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185. Draw the lines $x = -3,\ x = 2,\ y = -2,\ y = 3$ and write the coordinates of the vertices of the square so formed.

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186. Find the equations of the straight lines which pass through (4,3) and are respectively parallel and perpendicular to the x-axis.

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187. Find the equation of a line which is equidistant from the lines $x = -2\ and\ x = 6.$

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188. find the equation of a line equidistant from the lines $y = 10\, and\, y = -2.$

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189. Find the equation of a line with slope -1 and cutting of fan intercept of 4 units on negative direction of y-axis.

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190. Find the equation of a straight line which cuts off an intercept of 5 units on negative direction of y-axis and makes an angle 120^0 with the positive direction of x-axis.

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191. Find the equation of a straight line cutting off and intercept -1 from y-axis and being equally inclined to the axes.

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192. Find the equation of straight line which cuts off and intercept of length 3 on y-axis and is parallel to the line joining the points (3,-2) and (1,4).

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193. Find the equation of the straight line which makes an angle of 15° with the positive direction of x-axis and which cuts and intercept of length 4 on then negative direction of y-axis.

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194. Find the equation of a line making an angle of 150^0 with the x-axis and cutting off an intercept 2 from yaxis.

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195. Find the equation of a straight line: with slope 2 and y-intercept 3;

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196. Find the equation of a straight line: with slope -2 and intersecting the x-axis at a distance of 3 units to the left of origin.

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197. Find the equation of a straight line: with slope -1/3 and y-intercept -4.

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198. Find the equation of a line which makes an angle of $\tan^{-1}(3)$ with the x-axis and cuts off and intercept of 4 units on negative direction of y-axis.

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199. Find the equation of a line which is perpendicular to the line joining (4,2) and (3,5) and cuts off and intercept of length 3 on y-axis.

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200. Find the equation of the perpendicular to the segment joining (4,3) and (-1,1) if it cuts off and intercept -3 from y-axis.

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201. Find the equation of the straight line interesting y-axis at a distance of 2 units above the origin and making an angle of 0^0 with the positive direction of the x-axis

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202. Find the equation a line passing through (2,-3) and inclined at an angle of 15^0 with the positive direction of x-axis.

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203. Determine the equation of line through the point (-4 -3) and parallel to x-axis.

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204. Find the equation of the line for which $\tan\theta = \frac{1}{2}$, where θ is the inclination of the line and i. x-intercept equal to 4. Ii. y-intercepts is $-\frac{3}{2}$.

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205. The perpendicular from the origin to a line meets it at the point (-2, 9) find the equation of the line.

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206. Find the equation of the line passing through the point (0,1) making an angle $\frac{2\pi}{3}$ with the positive x-axis. Also, find equation of line parallel to it and crossing the y-axis at a distance of 2 units below the origin.

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207. Two lines passing through the point (2,3) intersect each other at an angle 60^0 . If slope of one lineis 2, find the equation of the other line.

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208. Find the equation of the line passing through (-3,5) and perpendicular to the line through the points (2,50 and (-3,6).

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209. A line perpendicular to the in segment joining the points (1,0) and (2,3) divides it in the ratio $1:n$. Find the equation of the line.

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210. Find the equation of the perpendicular bisector of the line segment joining the points (1,1) and (2,3).

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211. Find the equation of the straight line passing through the point (6,2) and having slope -3.

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212. Find the equation the straight line passing through (-2,3) and inclined at an angle of 45^0 with the x-axis.

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213. Find the equation of the line passing through (0,0) with slope m.

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214. Find the equation of the line passing through $\left(2, 2\sqrt{3}\right)$ and inclined with x-axis at an angle of 75^0 .

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215. Find the equation of the straight line which passes through the point (1,2) and makes such an angle with the positive direction of x-axis whose sine is $\frac{3}{5}$.

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216. Find the equation of the straight line passing through (3,-2) and making an angle of 60^0 with the positive direction of y-axis.

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217. Find the lines through the point (0,2) making angles $\frac{\pi}{3}$ and $\frac{2\pi}{3}$ with the x-axis. Also, find the lines parallel to the cutting the y-axis at a distance of 2 units below the origin.

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218. Find the equation of the straight lines which cut off an intercept 5 from the y-axis and are equally inclined to the axes.

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219. Find the equation of the line which intercepts a length 2 on the positive direction of the x-axis and is inclined at an angle of 135° with the positive direction of y-axis .

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220. Find the equation of the straight line which divide the join of the points (2,3) and (-5,8) in the ratio 3:4 and is also perpendicular to it.

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221. Find the equation of the right bisector of the line segment joining the points (3,40 and (-1,2).

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222. Find the equation of the right bisector of the line segment joining eth points $A(1, 0) and\ B(2, 3)$

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223. Find the equation of the line joining the points $(-1, 3) and\ (4, -2)$.

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224. Find the equation of the medians of the triangle ABC whose vertices are $A(2,5)B(-4,9)and\,C(-2,-1)$.

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225. Prove that the points $(5,1),\ (1,-1)and\,(11,4)$ are collinear. Also find the equation of the straight line on which these points lie.

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226. The Fahrenheit temperature F and absolute temperature K satisfy a linear equation. Given that $K=273$ when $F=32$ and that $K=373$ when$F=212$. Express K in terms of F and find the value of F, when $K=0$.

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227. Find the equation of the straight lines passing through the following pair of point: $(0, 0) and (2, -2)$.

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228. Find the equation of the straight lines passing through the following pair of point: $(0, -a) and (at_2, a/t_2)$

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229. Find the equation of the straight lines passing through the following pair of point: $(at_1, a/t_1)$ and $(at_2, a/t_2)$

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230. Find the equation of the straight lines passing through the following pair of point: $(a, b) and (a + c\sin\alpha, b + c\cos\alpha)$

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231. Find the equation of the straight lines passing through the following pair of point: $(a, b) and\ (a+b,\ a-b)$

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232. Find the equation of the straight lines passing through the following pair of point: $(a\cos\alpha,\ a\sin\alpha) and\ (a\cos\beta,\ a\sin\beta)$

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233. Find the equations to the sides of the triangles of the coordinates of whose angular points are respectively: (1,4), (2, -3) and (-1, -2).

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234. If the coordinates of the vertices of triangle ABC are $(-1, 6), (-3, -9)$ and $(5, -8)$, respectively, then find the equation of the median through C.

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235. Find the equation of the side BC of the triangle ABC whose vertices are $A(-1, -2), B(0, 1) and C(2, 0)$ respectivley. Also, find the equation of the median through $A(-1, -2)$.

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236. By using the concept of equation of a line, prove that the three points $(3, 0)$, $(2, 2)$ and $(8, 2)$ are collinear.

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237. Prove that the line $y - x + 2 = 0$ divides the join of points (3,-1) and (8,9) in the ratio 2:3.

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238. Find the equation to the straight line which bisects the distance between the points (a, b), (a', b') and also bisects the distance between the points $(-a, b) and (a', -b')$.

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239. In what ratio is the line joining the points $(2, 3) and (4, -5)$ divided by the line passing through the points (6,8) and (-3,-2).

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240. The vertices of a quadrilateral are $A(-2,6),\ B(1,2),\ C(10,4) and D(7,8)$. Find the equations of its diagonals.

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241. The length L (in centimetre) of a copper rod is a linear function of its Celsius temperature C. In an experiment, if $L = 124.942$ when $C = 20$ and $L = 125.134$ when $C = 110$, express L in terms of C.

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242. Find the equation of the line which cuts off an intercept 4 on the positive direction of x-axis and an intercept 3 on the negative direction of y-axis.

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243. Find the equation of the straight line which makes equal intercepts on the axes and passes through the point (2,3).

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244. Find the equation of the line which cuts off equal and positive intercepts from the axes and passes through the point (α, β).

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245. Find the equation of a straight line which passes through the point (4,-2) and whose intercept on y-axis is twice that on x-axis.

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246. Find the equation of the straight line whose intercepts on X-axis and Y-axis are respectively twice and thrice of those by the line

$3x + 4y = 12.$

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247. Find the equation of the line through (2,3) so that the segment of the line intercepted between the axes is bisected at this point.

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248. A line passes through the point (3,-2). Find the locus of the middle point of the portion the line intercepted between the axes.

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249. Find the equations of the lines, which cut-off intercepts on the axes whose sum and product are 1 and -6 , respectively.

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250. Find eqn of lines pass through origin and trisect the intercept of line $3x + 4y = 12$ between the axes. 4.

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251. Find the equation to the straight line: cutting off intercepts 3 and 2 from the axes.

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252. Find the equation to the straight line: cutting off intercepts -5 and 6 from the axes.

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253. Find the equation to the straight line which passes through the point (5,6) and has intercepts on the axes. i)equal in magnitude and both

postive ii)equal in magnitude but opposite in sign

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254. A straight line passes through the point (α, β) and this point bisects the portion of the line intercepted between the axes. Show that the equation of the straight line is $\frac{x}{2\alpha} + \frac{y}{2\beta} = 1$.

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255. Point R (h, k) divides a line segment between the axes m the ratio $1:2$. Find equation of the line.

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256. Find the equation of the straight line which passes through the point (-3, 8) and cuts off positive intercepts on the coordinate axes whose sum is 7.

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257. The equation of straight line which passes through the point (-4,3) such that the portion of the line between the axes is divided by the point in ratio 5:3 is -

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258. Find the equation of a line which passes through the point $(22, -6)$ and is such that the intercept on x-axes exceeds the intercept on y-axis by 5.

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259. Find the equation of the line which passes through $P(1, -7)$ and meets the axes at $AandB$ respectively so that $4AP - 3BP = 0$.

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260. Find equation of the line passing through the point (2, 2) and cutting off intercepts on the axes whose sum is 9.

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261. Find the equation of straight line which passes through the point P(2,6) and cuts the coordinate axis at the point A and B respectively so that AP:BP=2:3.

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262. Find the equations of the straight lines which pass through the origin and trisect the portion of the straight line $2x + 3y = 6$ which is intercepted between the axes.

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263. find the equation of the straight line passing through $(2, 1)$ and bisecting the portion of the straight line $3x - 5y = 15$ lying between the axes.

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264. Find the equation of the straight line passing through the origin and bisecting the portion of the line $ax + by + c = 0$ intercepted between the coordinate axes.

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265. Find the equation of the straight line which is at a distance 3 from the origin and perpendicular from the origin to the line makes an angle of 30° with the positive direction of the x-axis.

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266. the length of the perpendicular from the origin to a line is 7 and a line makes an angle of 150° with the positive direction of y-axis . then the equation of the line is:

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267. Find the equation of the straight line upon which the length of perpendicular from origin is $3\sqrt{2}$ units and this perpendicular makes an angle of 75° with the positive direction of x-axis.

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268. Find the equation of a line for which: $p = 5, \alpha = 60^\circ$

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269. Find the equation of a line for which: $p = 8, \alpha = 225^\circ$

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270. Find the equation of a line for which: $p = 8, \alpha = 300^\circ$

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271. Find the equation of the line whose perpendicular distance from the origin is 4 units and the angle which the normal makes with positive direction of xaxis is 150° .

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272. Find the equation f the straight line at a distance of 3 units from the origin such that the perpendicular from the origin to the line makes and angle α given by $tan\alpha = \frac{5}{12}$ with the positive direction of x-axis.

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273. Find the equation of the straight line upon which the length of the perpendicular from the origin is 2 and the slope of this perpendicular is $\frac{5}{12}$.

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274. the length of the perpendicular from the origin to a line is 7 and a line makes an angle of 150° with the positive direction of y-axis . then the equation of the line is:

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275. Find the values of θ and p, if the equation $x\cos\theta + y\sin\theta = p$ is the normal form of the line $\sqrt{3}x + y + 2 = 0$.

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276. A straight line drawn through the point $P(2, 3)$ and is incline at an angle of 30° with the x-axis. Find the coordinates of two points on it a distance 4 from P on either side of P.

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277. Find the distance of the line $4x - y = 0$ from the point P(4, 1) measured along the line making an angle of $135o$ with the positive xaxis.

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278. Find the distance of the line $4x + 7y + 5 = 0$ from the point $(1, 2)$ along the line $2x - y = 0$.

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279. Find the direction in which a straight line must be drawn through the point $(-1, \quad 2)$ so that its point of intersection with the line $x \quad + \quad y \quad = \quad 4$ may be at a distance of 3 units from this point.

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280. A line is such that its segment between the lines $5x - y + 4 = 0$ and $3x + 4y - 4 = 0$ is bisected at the point (1,5). Obtain its equation.

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281. If the straight line through the point (3,4) makes an angle $\frac{\pi}{6}$ with x-axis and meets the line 12 x + 5 y + 10 = 0 at Q, Then the length of PQ is :

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282. A Straight line drawn through the point $A(2, 1)$ making an angle $\pi/4$ with positive x-axis intersects another line $x + 2y + 1 = 0$ in het point B. Find length AB.

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283. a line drawn through $A(4, -1)$ parallel to the line $3x - 4y + 1 = 0$. Find the coordinates of two points on this line which are at a distance of 5 units from A

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284. The straight line through $P(x_1, y_1)$ inclined at an angle θ with the x-axis meets the line $ax + by + c = 0 \in Q$. Find the length of PQ.

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285. Find the distance of point (2,3) from the line $2x - 3y + 9 = 0$ measured along a line making an angle of 45^0 with the x-axis.

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286. Find the distance of the point (2,5) from the line $3x + y + 4 = 0$ measured parallel to a line having slope 3/4.

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287. Find the distance of the point $(3, 5)$ from the line $2x + 3y = 14$ measured parallel to the line $x - 2y = 1$.

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288. Find the distance of the point (2,5) from the line $3x + y + 4 = 0$ measured parallel to the line $3x - 4y + 8 = 0$

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289. Find the distance of the line $2x + y = 3$ from the point$(-1, -3)$ in the direction of the line whose slope is 1.

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290. A line is such that its segment between the lines $5x - y + 4 = 0$ and $3x + 4y - 4 = 0$ is bisected at the point (1,5). Obtain its equation.

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291. The equation of straight line passing through (-2,-7) and having an intercept of length 3 .

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292. Reduce the lines $3x - 4y + 4 = 0$ and $4x - 3y + 12 = 0$ to the normal form and hence determine which line is nearer to the origin.

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293. Reduce the lines $3x - 4y + 4 = 0$ and $2x + 4y - 5 = 0$ to the normal form and hence determine which line is nearer to the origin.

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294. Find the equation of a line with slope 2 and the length of the perpendicular form the origin equal to $\sqrt{5}$.

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295. Find the distance of the point (2,5) from the line $3x + y + 4 = 0$ measured parallel to the line $3x - 4y + 8 = 0$

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296. Reduce the following equations to the normal form and find $p \, and \, \alpha$ in each case: $x - y = 4$.

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297. Reduce the equation $\sqrt{3}x + y + 2 = 0$ to: Slope intercept form and find slope and y-intercept. Intercept form and find intercept on the axes The normal form and find $p \, and \, \alpha$

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298. Reduce the following equations to the normal form and find $p \, and \, \alpha$ in each case: $x + \sqrt{3}y - 4 = 0$

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299. Reduce the following equations to the normal form and find $p \, and \, \alpha$ in each case: $x + y + \sqrt{2} = 0$

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300. Reduce the following equations to the normal form and find $p \, and \, \alpha$ in each case: $x - y + 2\sqrt{2} = 0$

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301. Reduce the following equations to the normal form and find $p \, and \, \alpha$ in each case: $x - 3 = 0$

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302. Reduce the following equations to the normal form and find $p \, and \, \alpha$ in each case: $y - 2 = 0$

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303. Put the equation $\frac{x}{a}+\frac{y}{b}=1$ to the slope intercept form and find its slope and y-intercept

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304. Reduce the following equations to the normal form and find $p\ and\ \alpha$ in each case: $x-y+2\sqrt{2}=0$

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305. Find the values of θ and p, if the equation $x\cos\theta+y\sin\theta=p$ is the normal form of the line $x-\sqrt{3}y-12=0$

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306. Find the values of θ and p, if the equation $x\cos\theta + y\sin\theta = p$ is the normal form of the line $\sqrt{3}x + y + 2 = 0$.

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307. Reduce the equation $3x - 2y + 6 = 0$ to the intercept form and find the $x\ and\ y$ intercepts.

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308. The perpendicular distance of a line from the origin is 5 units and its slope is -1. Find the equation of the line.

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309. Find the coordinates of the point of intersection of the lies $2x - y + 3 = 0\ and\ x + 2y - 4 = 0.$

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310. Find the area of the triangle formed by the lines $y = x, y = 2x, y = 3x + 4$

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311. \ The equation of the medians of a triangle formed by the lines $x + y - 6 = 0, x - 3y - 2 = 0$ and $5x - 3y + 2 = 0$ is

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312. Show that the area of the triangle formed by the lines $y = m_1x + c_1, y = m_2x + c_2$ and $x = 0$ is $\frac{(c_1 - c_2)^2}{2|m_1 - m_2|}$

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313. Find the equation of the line parallel to y-axis and drawn through the point of intersection of the lines $x - 7y + 5 = 0 \, and \, 3x + y = 0.$

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314. Find the point of intersection of the following pairs of lines: $2x - y + 3 = 0 \, and \, x + y - 5 = 0$

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315. Find the point of intersection of the following pairs of lines: $bx + ay = ab \, and \, bx + by = ab.$

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316. Find the point of intersection of the following pairs of lines: $y = m_1 x + \frac{a}{m_1} \, and \, y = m_2 x + \frac{a}{m_2}.$

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317. Find the coordinates o the vertices of a triangle, the equations of whose sides are: $x + y - 4 = 0,\ 2x - y + 3 = 0\ and\ x - 3y + 2 = 0$

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318. Find the coordinates o the vertices of a triangle, the equations of whose sides are:

$y(t_1 + t_2) = 2x + 2at_1at_2,\ y(t_2 + t_3) = 2x + 2at_2t_3\ and\ , y(t_3 + t_1) = 2x$

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319. Show that the area of the triangle formed by the lines $y = m_1x + c_1, y = m_2x + c_2$ and $x = 0$ is $\frac{(c_1 - c_2)^2}{2|m_1 - m_2|}$

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320. Find the area of triangle formed by the lines : $y = 0,\ x = 2\ and\ x + 2y = 3.$

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321. Find the area of triangle formed by the lines : $x + y - 6 = 0,\ x - 3y - 2 = 0\ and\ 5x - 3y + 2 = 0$

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322. Find the equations of the medians of a triangle, the equations of whose sides are: $3x + 2y + 6 = 0,\ 2x - 5y + 4 = 0\ and\ x - 3y - 6 = 0$

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323. Prove that the lines $y = \sqrt{3}x + 1,\ y = 4\ nd\ y = -\sqrt{3}x + 2$ form an equilateral triangle.

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324. Classify the following pairs of lines as coincident, parallel or intersecting: $2x + y - 1 = 0 \, and \, 3x + 2y + 5 = 0$

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325. Classify the following pairs of lines as coincident, parallel or intersecting: $3x + 2y - 4 = 0 \, and \, 6x + 4y - 8 = 0$

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326. Find the equation of the line joining the point (3,5) to the point of intersection of the lines $4x + y - 1 = 0 \, and \, 7x - 3y - 35 = 0$

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327. Find the equation of the lien passing through the point of intersection of the lines $4x - 7y - 3 = 0 \, and \, 2x - 3y + 1 = 0$ that has equal interception te axes.

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328. Show that the area of the triangle formed buy the lines $y = m_1 x, y = m_2 x \, and \, y = c$ is equal to $\frac{c^2}{4}\left(\sqrt{33} + \sqrt{11}\right) where \, m_1, \, m_2$ are the roots of the equation $x^2 + \left(\sqrt{3} + 2\right)x + \sqrt{3} - 1 = 0.$

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329. Prove that the lines $\sqrt{3}x + y = 0, \, \sqrt{3}y + x = 0, \, \sqrt{3}x + y = 1 \, and \, \sqrt{3}y + x = 1$ form a rhombus.

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330. Find the equation of the line passing through the intersection of the lines $2x + y = 5 \, and \, x + 3y + 8 = 0$ and parallel to the line $3x + 4y = 7.$

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331. Prove that the lies $3x + y - 14 = 0, \; x - 2y = 0 \, nad \, 3x - 8y + 4 = 0$ are concurrent.

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332. If the lines $a_1x + b_1y + 1 = 0, \; a_2x + b_2y + 1 = 0 \, and \, a_3x + b_3y + 1 = 0$ are concurrent, show that the points $(a_1, b_1), \; (a_2, b_2) and \, (a_3, b_3)$ are collinear.

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333. Show that the following lines are concurrent:

$L_1 = (a-b)x + (b-c)y + (c-a) = 0$

$L_2 = (b-c)x + (c-a)y + (a-b) = 0$

$L_3 = (c-a)x + (a-b)y + (b-c) = 0$

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334. Prove that the following sets of three lines are concurrent:

$15x - 18y + 1 = 0,\ 12x + 10y - 3 = 0\ and\ 6x + 66y - 11 = 0.$

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335. Prove that the following sets of three lines are concurrent:

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

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336. For what value of λ are the three lines $2x - 5y + 3 = 0,\ 5x - 9y + \lambda = 0\ and\ x - 2y + 1 = 0$ concurrent?

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337. Find the conditions that the straight lines $y = m_1x + c_1, y = m_2x + c_2 and\ y = m_2x + c_3$ may meet in a point.

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338. Show that the straight lines $L_1 = (b + c)x + ay + 1 = 0,\ L_2 = (c + a)x + by + 1 = 0\ nd\ L_3 = (a + b$ are concurrent.

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339. If the three lines $ax + a^2y + 1 = 0,\ bx + b^2y + 1 = 0\ and\ cx + c^2y + 1 = 0$ are concurrent, show that at least two of three constants a, b, c are equal.

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340. If a, b, c are in A.P. prove that the straight lines $ax + 2y + 1 = 0,\ bx + 3y + 1 = 0\ and\ cx + 4y + 1 = 0$ are concurrent.

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341. Show that the perpendicular bisectors of the sides of a triangle are concurrent.

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342. Find the equation of the line which is parallel to $3x - 2y + 5 = 0$ and passes through the point $(5, -6)$

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343. Find the equation of the straight line that passes through the point $(3, 4)$ and is perpendicular to the line $3x + 2y + 5 = 0$

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344. Find equation of the line perpendicular to the line $x - 7y + 5 = 0$ and having x intercept 3.

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345. A person standing at the junction (crossing) of two straight paths represented by the equations $2x - 3y + 4 = 0$ and $3x + 4y - 5 = 0$

wants to reach the path whose equation is $6x - 7y + 8 = 0$ in the least time. Find equation of the path that he should follow.

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346. The equations of two sides of a triangle are $3x - 2y + 6 = 0 \, and \, 4x + 5y - 20 \, and$ the orthocentre is (1,1). Find the equation of the third side.

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347. Find the circumcentre of the triangle whose sides are $3x - y + 3 = 0, 3x + 4y + 3 = 0$ and $x + 3y + 11 = 0.$

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348. Find the equation of a line passing through the point (2,3) and parallel to the line and parallel to the line $x - 4y + 5 = 0$.

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349. find the equation of a line passing through (3,-2)and perpendicular to the line $x - 3y + 5 = 0$

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350. Find the equation of the perpendicular bisector of the line joining the points (1,3) and (3,1).

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351. Find the equation is of the altitudes of as $\mathrm{Delta} ABC$ whose vertices are $A(1, 4),\ B(-3, 2) and C(-5,\ -3)$.

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352. Find the equation of a line which is perpendicular to the line $\sqrt{3}x - y + 5 = 0$ and which cuts of an intercept of 4 units with the negative direction of y-axis.

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353. Find the equation of the straight line through the point (α, β) and perpendiculasr to the line $lx + my + n = 0$.

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354. Find the equation of the straight line perpendicular to $2x - 3y = 5$ and cutting off an intercept 1 on the positives direction of the x-axis.

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355. Find the equation of the straight line perpendicular to $5x - 2y = 8$ and which passes through the mid point of the line segment joining (2,3) and (4,5).

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356. Find the equation of the straight line which has y-intercept equal to 4/3 and is perpendicular to $3x - 4y + 11 = 0$.

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357. Find the equation of the right bisector of the line segment joining the points $(a, b) and (a_1, b_1)$.

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358. Find the image of the point (2,1) with respect to the line mirror $x + y - 5 = 0$

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359. If the image of the point $(2, 1)$ with respect to a line mirror be $(5, 2)$, find the equation of the mirror.

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360. Find the equation to the straight line parallel to $3x - 4y + 6 = 0$ and passing through the middle point of the joint of points (2,3), and (4,-1).

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361. Prove that the lines $2x - 3y + 1 = 0,\ x + y = 3,\ 2x - 3y = 2\ and\ x + y = 4$ form a parallelogram.

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362. Find the equation of a line drawn perpendicular to the line $\frac{x}{4} + \frac{y}{6} = 1$ through the point where it meets the y axis.

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363. The perpendicular from the origin to the line $y = mx + c$ meets it at the point (-1,2). Find the values of m and c.

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364. Find the equation of the right bisector of the line segment joining the points $(3, 4)$ and (-1.2).

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365. The line through $(h, 3) and (4, 1)$ intersects the line k $7x - 9y - 19 = 0$ at right angle. Find the value of h.

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366. Find the image of the point $(3, 8)$ with respect to the line $x + 3y = 7$ assuming the line to be a plane mirror.

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367. Find the coordinates of the foot o the perpendicular from the point (-1, 3) to the line $3x - 4y - 16 = 0$

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368. Find the projection of the point (1,0) on the line joining the points (-1,2) and (5,4).

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369. Find the equation of a line perpendicular to the line $3x + y + 5 = 0$ and at a distance of 3 units from the origin.

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370. The line $2x + 3y = 12$ meets the x-axis at A and y-axis at B. The line through (5,5) perpendicular to AB meets the x-axis and the line AB at C and E respectively. If O is the origin of coordinates, find the area of figure OCEB.

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371. Find the equation of the straight line which cuts off intercept on X-axis which is twice that on Y-axis and is at a unit distance from the origin.

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372. The equations of the perpendicular bisectors of the sides $ABandAC$ of triangle ABC are $x-y+5=0$ and $x+2y=0$, respectively. If the point A is $(1,\ -2)$, then find the equation of the line BC.

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373. Find the angles between the pairs of straight lines: $x+\sqrt{3}y-5=0\ and\ \sqrt{3}x+y-7=0$

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374. Find the angles between the pairs of straight lines: $y = (2 - \sqrt{3})x + 5$ *and* $y = (2 + \sqrt{3})x - 7.$

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375. Find the obtuse angle between the lines $x - 2y + 3 = 0$ *and* $3x + y - 1 = 0.$

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376. A line passing through the points $(a, 2a)$ and $(-2, 3)$ is perpendicular to the line $4x + 3y + 5 = 0$, find the value of a.

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377. The hypotenuse of a right angled triangle has its ends at the points $(1, 3)$ and $(4, 1)$. Find the equation of the legs (perpendicular sides) of

the triangle.

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378. Find the angles between each of the following pairs of straight line:

$3x + y + 12 = 0 \, and \, x + 2y - 1 = 0$

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379. Find the angles between each of the following pairs of straight line:

$3x + 4y - 7 = 0 \, and \, 4x - 3y + 5 = 0$

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380. Find the angles between each of the following pairs of straight line:

$3x - y + 5 = 0 \, and \, x - 3y + 1 = 0$

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381. Find the angles between each of the following pairs of straight line: $x - 4y = 3 \, and \, 6x - y = 11.$

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382. Find the acute angle between the lines $2x - y + 3 = 0 \, and \, x + y + 2 = 0.$

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383. Prove that the points (2,-1), (0,2), (2,3) and (4,0) are the coordinates other vertices of a parallelogram and find the angle between its diagonals.

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384. Find the angle between the line joining the points (2,0), (0,3) and the line $x + y = 1$.

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385. If θ is the angle which the straight line joining the points $(x_1, y_1) and (x_2, y_2)$ subtends at the origin, prove that $\tan\theta = \frac{x_2 y_1 - x_1 y_2}{x_1 x_2 + y_1 y_2} and \cos\theta = \frac{x_1 x_2 + y_1 y_2}{\sqrt{x12 + y12x22 + y22}}$

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386. Find the angle between the lines $x = a\ and\ by + c = 0$.

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387. Find the tangent of the angle between the lines which have intercepts 3, 4, and 1, 8 on the axes respectively.

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388. Show that the line $a^2x + ay + 1 = 0$ is perpendicular to the line $x - ay = 1$ for all non zero real values of a.

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389. Show that the tangent of an angle between the lines $\frac{x}{a} + \frac{y}{b} = 1$ and $\frac{x}{b} - \frac{y}{b} = 1\ is \frac{2ab}{a^2 - b^2}$

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390. Find the values of the parameter a so that the point (a, 2) is an interior point of the triangle formed by the lines x+y-4=0, 3x-7y-8=0and 4x-y-31 = 0.

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391. ermine whether the point$(-3, 2)$ lies inside or outside the triangle whose sides are given by the equations $x + y - 4x + 8 - 0, 4x - y - 31 - 0.$

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392. Find the distance between the line $12x - 5y + 9 = 0$ and the point (2,1).

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393. If p and p be the perpendicular form the origin upon the straight lines $x \sec\theta + y \cos ec\theta = a$ and $x \cos\theta - y \sin\theta = a \cos 2\theta$

Prove that : $4p^2 + p^2 = a^2$

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394. What are the points on x-axis whose perpendicular distance from the line $4x + 3y = 12\ is\ 4?$

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395. Find the points on y-a xi s whose perpendicular distance from the line $4x - 3y - 12 = 0$ is 3.

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396. The points on $x + y = 4$ that lie at a unit distance from the line $4x + 3y - 10 =$ are

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397. Find the distance of the point (4,5) from the straight line $3x - 5y + 7 = 0$

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398. Find the perpendicular distance of the line joining the points $(\cos\theta, \sin\theta)$ and $(\cos\phi, \sin\theta)$ and $(\cos\phi \text{ and } \sin\phi)$ from the origin.

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399. Find the length of the perpendicular from the origin to the straight line joining the two points whose coordinates are $(a\cos\alpha,\ a\ s \in \alpha) and\ (a\cos\beta,\ a\sin\beta)$.

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400. Show that the perpendiculars let fall from any point on the straight line $2x + 11y - 5 = 0$ upon the two strasightr lines $24x + 7y = 20\ and\ 4x - 3y - 2 = 0$ are equal to each other.

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401. Find the length of the perpendicular draw from the point $(4, -7)$ upon the straight line passing through the origin and the point of intersection of the lines $2x-3y+14=0$ and $5x+5y=7$

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402. What are the points on the x-axis whose perpendicular distance from the line $\frac{x}{a}+\frac{y}{b}=1$ is a

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403. Show that the product of perpendiculars on the line $\frac{x}{a}\cos\theta+\frac{y}{b}s\int h\eta=1$ from the points $\left(\pm\sqrt{a^2-b^2},\ 0\right)is\ b^2.$

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404. Find the perpendicular distance from the origin of the perpendicular from the point (1,2) upon the straight line $x - 3y + 4 = 0$.

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405. Find the distance of the point (1,2) from the straight line with slope 5 and passing through the point of intersection of $x + 2y = 5\ and\ x - 3y = 7$.

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406. What are the points on the yaxis whose distance from the line $\frac{x}{3} + \frac{y}{4} = 1$is 4 units.

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407. In the triangle ABC with vertices A (2, 3), B (4, 1) and C (1, 2), find the equation and length of altitude from the vertex A.

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408. Show that the path of a moving point such that its distances from two lines $3x - 2y = 5$and $3x + 2y = 5$are equal is a straight line.

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409. If sum of the perpendicular distances of a variable point $P(x, y)$ from the lines $x + y5 = 0$and $3x2y + 7 = 0$is always 10. Show that P must move on a line.

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410. Find the distance between the parallel lines $3x - 4y + 9 = 0 \, and \, 6x - 8y - 15 = 0.$

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411. Find the equation of the line mid way between the parallel lines $9x + 6y - 7 = 0 \, and \, 3x + 2y + 6 = 0.$

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412. Determine the distance between the pair of parallel lines : $4x - 3y - 9 = 0$ and $4x - 3y - 24 = 0$

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413. Determine the distance between the following pair of parallel lines: $8x + 15y - 34 = 0 \, and \, 8x + 15y + 31 = 0$

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414. Determine the distance between the following pair of parallel lines:

$y = mx + c \, and \, y = mx + d$

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415. Determine the distance between the following pair of parallel lines:

$4x + 3y - 11 = 0 \, and \, 8x + 6y = 15.$

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416. If two sides of a square are along $5x - 12y + 26 = 0$ and $5x - 12y - 65 = 0$ then find its area.

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417. Prove that the lines $2x + 3y = 19$ and $2x + 3y + 7 = 0$ are equidistant from the line $2x + 3y = 6$.

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418. Find the equation of the line midway between the parallel lines $9x + 6y - 7 = 0$ and $3x + 2y + 6 = 0$

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419. Prove that the area of the parallelogram contained by the lines $4y - 3x - a = 0, 3y - 4x + a = 0, 4y - 3x - 3a = 0,$ and $3y - 4x + 2a = 0$ is $\left(\frac{2}{7}\right)a^2.$

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420. The equation of two straight lines through $(7, 9)$ and making an angle of 60° with the line $x - \sqrt{3}y - 2\sqrt{3} = 0$ is

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421. Find the equation of the lines through the point (3, 2) which make an angle of 45° with the line $x - 2y = 3$.

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422. Show that the equation of the straight line through the origin angle φ with the line $y = mx + b\, is \frac{y}{x} = \frac{m \pm tan\varphi}{1 \pm m\, tan\varphi}$

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423. One diagonal of a square is along the line $8x - 15y = 0$ and one of its vertex is (1, 2). Then the equations of the sides of the square passing

through this vertex are $23x + 7y = 9, 7x + 23y = 53$

$23x - 7y + 9 = 0, 7x + 23y + 53 = 0$

$23x - 7y - 9 = 0, 7x + 23y - 53 = 0$ none of these

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424. Find the equation f eth straight lines passing through the origins and making an angle of 45° with the straight line $\sqrt{3}x + y = 11$.

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425. Find the equations of the straight lines passing through (2,-10 and making and angle of 45° with the line $6x + 5y - 8 = 0$

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426. Find the equations of the lines which pass through the origin and are inclined at an angle $\tan^{-1} m$ to the line $y = mx + c$.

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427. Find the equations t the straight lines passing through the point (2,-3) and inclined at an angle of 45° to the line $y = 3x + 4$.

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428. The equation of one side of an equilateral triangle is $x - y = 0$ and one vertex is $\left(2 + \sqrt{3},\ 5\right)$. Prove that a second side is $y + \left(2 - \sqrt{3}\right)x = 6$ and find the equation of the third side.

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429. Find the equations of two straight lines passing though (1,2) and making an angle of 60° with the line $x + y = 0$. Find also the area of the triangle formed by the three lines.

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430. Show that the point (3,-5) lies between the parallel lines $2x + 3y - 7 = 0 \, and \, 2x = 3y + 12 = 0$ and find the equation of lines through (3,-5) cutting the above lines at an angle of 45° .

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431. If two opposite vertices of a square are (1,2) and (5,8) find the coordinates of its other two vertices and the equations of its sides.

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432. Obtain the equations of the line passing through the intersection of lines $4x - 3y - 1 = 0 \, and \, 2x - 5y + 3 = 0$ and equally inclined to the axes.

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433. Let ax+by+c=0 be a variable straight line, where a, b and c are 1st, 3rd and 7th terms of some increasing A.P. Then the variable straight line always passes through a fixed point which lies on

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434. Find the equation of a straight line through the point of intersection of the lines $4x - 3y = 0 \, and \, 2x - 5y + 3 = 0$ and parallel to $4x + 5y + 6 = 0.$

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435. Find the equation of a straight line passing through the point of intersection of $x + 2y + 3 = 0 \, and \, 3x + 4y + 7 = 0$ and perpendicular to the straight line $x - y + 8 = 0.$

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436. Find the equation of the line passing through the point of intersection of $2x - 7y + 11 = 0 \, and \, x + 3y - 8 = 0$ and is parallel to i. x-axis ii. y-axis.

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437. Find the equation of the straight line drawn through the point of intersection of the lines $x + y = 4$ and $2x - 3 = 1$ and perpendicular to the line cutting off intercepts 5,6 on the axes.

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438. Prove that the family of lines represented by $x(1 + \lambda) + y(2 - \lambda) + 5 = 0, \lambda$ being arbitrary, pass through a fixed point. Also find the fixed point.

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439. Find the equation of the straight line which passes through the point of intersection of the lines $3x - y = 5 \, and \, x + 3y = 1$ and makes with the coordinate axes a triangle of area $\frac{3}{8}$ sq. units.

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440. Find the equation of the line through the point of intersection of, the lines $x - 3y + 1 = 0$ and $2x + 5y - 9 - 0$ and whose distance from the origin is $\sqrt{5}$

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441. Write an equation representing a pair of lines through the point (a, b) and parallel to the coordinate axes.

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442. Write the coordinates of the orthocentre of the triangle formed by the lines $x^2 - y^2 = 0 \, and \, x + 6y = 18.$

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443. If the centroid of a triangle formed by the points (0,0), $\left(\cos\theta, \; s\int h\eta\right) and \left(s\int h\eta, \; -\cos\theta\right)$ lies on the line $y = 2x$ then write the value of $tan\theta$.

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444. Write the value of $\theta \in \left(0, \frac{\pi}{2}\right)$ for which area of the triangle formed by points $O(0, 0), A(a\cos\theta, b\sin\theta)$and $B(a\cos\theta, \; -b\sin\theta)$ is maximum.

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445. The distance between the lines $4x + 3y = 11$ and $8x + 6y = 15$ is

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446. Write the coordinates of the orthocentre of the triangle formed by the lines $xy = 0 \, and \, x + y = 1$.

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447. If the lines $x + ay + a = 0, \; bx + y + b = 0 \, and \, cx + cy + 1 = 0$ are concurrent, then write the value of $2abc - ab - bc - ca$.

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448. Write the area of the triangle formed by the coordinate axes and the line $(sec\theta - tan\theta)x + (sec\theta + tan\theta)y = 2$.

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449. Write the coordinates of the image of the point $(3, 8)$ in the lines $x + 3y - 7 = 0$.

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450. Write the integral values of m for which the x-coordinates of the point of intersectioin of eh lines $y = mx + 1 \, and \, 3x + 4y = 9$ is an integer.

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451. The equation $(b - c)x + (c - a)y + (a - b) = 0$ and $(b^3 - c^3)x + (c^3 - a^3)y + a^3 - b^3 = 0$ will represent the same line if

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452. If a, b, c are in G.P. write te area of the triangle formed by the line $ax + by + c = 0$ with the coordinates axes.

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453. Write the locus of a point the sum of whose distances from the coordinates axis is unity.

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454. If $a, \ b, c$ are in A.P., then the line $ax + by + c = 0$ passes through a fixed point. write the coordinates of that point.

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455. Find the locus of the mid points of the portion of the lines $x \sin\theta + y \cos\theta = p$ intercepted between the axes.

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456. L is a variable line such that the algebraic sum of the distances of the points (1,1) (2,0) and (0,2) from the line is equal to zero. The line L will always pass through a. (1,1) b. (2,1) c. (1,2) d. none of these

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457. The acute angle between the medians drawn from the acute angles of a right angle isosceles triangle is

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458. The distance between the orthocentre and circumcentre of the triangle with vertices $(1, 2),\ (2, 1)\ and\ \left(\frac{3+\sqrt{3}}{2}, \frac{3+\sqrt{3}}{2}\right)$ is

a. 0 b. $\sqrt{2}$ c. $3+\sqrt{3}$ d. none of these

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459. The equation of the straight line which passes through the point $(-4, 3)$ such that the portion of the line between the axes is divided internally be the point in the ratio $5:3$ is $9x - 20y + 96 = 0$ $9x + 20y = 24$ $20x - 9y + 53 = 0$ none of these

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460. The point which divides the join of (1,2) and(3,4) externally in the ratio 1:1 a. lies in the III quadrant b. lies in the II quadrant c. lies in the I quadrant d. cannot be found

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461. A line passes through the point $(2, 2)$ and is perpendicular to the line $3x + y = 3,$ then its y-intercept is

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462. I the lines $ax + 12y + 1 = 0,\ bx + 13y + 1 = 0$ and $cx + 14y + 1 = 0$ are concurrent, then a, b, c are in a. H.P. b. G.P. c. A.P. d. none of these

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463. The number of real values of λ for which the lines $x - 2y + 3 = 0,\ \lambda x + 3y + 1 = 0\ and\ 4x - \lambda y + 2 = 0$ are concurrent is a. 0 b. 1 c. 2 d. Infinite

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464. The equations of the sides $AB,\ BC\ and\ CA\ of$triangleA B C $are\ y - x = 2,\ x + 2y = 1\ and\ 3x + y + 5 = 0$ respectively. The equation of the altitude through B is $x - 3y + 1 = 0$ b. $x - 3y + 4 = 0$ c. $3x - y + 2 = 0$ d. none of these

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465. If $p_1 and\ p_2$ are the lengths of te perpendiculars from the origin upon the lines $x\ sec\theta + hy \cos ec\theta = a\ and\ x\cos\theta - y\sin\theta = a\cos 2\theta$ respectively, then $4p12 + p22 = a^2$ b. $p12 - 4p22 = a^2$ c. $p12 + p22 = a^2$ d. none of these

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466. Area of the triangle formed by the points $((a+3)(a+4),\ a+3),\ ((a+2)(a+3),(a+2))and\ (a+1),\ (a+2),$ is $25a^2$ b. 5^2 c. $24a^2$ d. none of these

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467. If $a+b+c=0$, then the family of lines $3ax + by + 2c = 0$ pass through fixed point $a.\ \left(2, \frac{2}{3}\right) b.\ \left(\frac{2}{3}, 2\right) c.\ \left(-2, \frac{2}{3}\right) d.$ none of these

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468. The line segment joining the points (-3,-4), and (1,-2) is divided by y-axis in the ratio a. 1:3 b. 2:3 c. 3:1 d. 3:2

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469. The area of a triangle with vertices at (-4,-1), (1,2) and (4,-3) is a. 17 b. 16 c. 15 d. none of these

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470. The line segment joining the points (1,2) and (-2,1) is divided by the line $3x + 4y = 7$ in the ratio a. 3:4 b. 4:3 c. 9:4 d. 4:9

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471. If the point (5,2) bisects the intercept of a line between the axes, then its equation is $5x + 2y = 20$ b. $2x + 5y = 20$ c. $5x - 2y = 20$ d. $2x - 5y = 20$

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472. $A\ (6, 3),\ B(\ -3, 5),\ C(4,\ -2)\ and\ D(x, 3x)$ are four points. If $\text{Delta}DBC : \text{Delta}ABC = 1 : 2,$ then x is equal to a. 11/8 b. 8/11 c. 3 d. none of these

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473. If p be the length of theperpendicular from the origin on the line $x/a + y/b = 1,$ then $p^2 = a^2 + b^2$ b. $p^2 = \frac{1}{a^2} + \frac{1}{b^2}$ c. $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$ d. none of these

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474. The equation of the line passing through (1,5) and perpendicular to the line $3x - 5y + 7 = 0$ is $5x + 3y - 20 = 0$ b. $3x - 5y + 7 = 0$ c. $3x - 5y + 6 = 0$ d. $5x + 3y + 7 = 0$

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475. The figure formed by the lines $ax \pm y \pm c = 0$ is a. a rectangle b. a square c. a rhombus d. none of these

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476. Two vertices of triangle are (-2,-1) and (3,2) and third vertex lies on the line $x + y = 5$. If the area of the triangle is 4 square units, then the third vertex is a. (-0,50 or (4,1) b. (5,0) of (1,4) c. (5,0) or (4,1) d. (o,5) or (1,4)

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477. (i) Find the gradient of a straight line which is passes through the point (-3. 6) and the mid point of (4,-5) and (-2, 9)

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478. The angle between the lines $5x + 3y - 7 = 0\ and\ 15x + 9y + 14 = 0$ is ^0d. 30^0`

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479. Distance between the lines $5x + 3y - 7 = 0\ and\ 15x + 9y + 14 = 0$ is $\frac{35}{\sqrt{34}}$ b. $\frac{1}{3\sqrt{34}}$ c. $\frac{35}{3\sqrt{34}}$ d. $35\,/\,2\sqrt{34}$

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480. The value of λ for which the lines $3x + 4y = 5, 5x + 4y = 4\, and\, \lambda x + 4y = 6$ meet at a point is 2 b. 3 c. 1 d. 4

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481. Three vertices of a parallelogram, taken in order, are (-1, -6), (2,-5) and (7,2). Write the coordinates of its fourth vertex.

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482. The centroid of triangle is (2,7) and two of its vertices are (4,8) and (-2,6). The third vertex is $(0, 0)$ b. $(4, 7)$ c. $(7, 4)$ d. $(7, 7)$

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483. The medians $AD\ and\ BE$ of a triangle with vertices $A(0, b),\ B(0, 0)\ and\ C(a, 0)$ are perpendicular to each other, if $a = \frac{b}{2}$

b. $b = \frac{a}{2}$ c. $ab = 1$ d. $a = \pm\sqrt{2}b$

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484. The equation of the line with gradient $-\frac{3}{2}$ which is concurrent with the lines $4x + 3y - 7 = 0$ and $8x + 5y - 1 = 0$

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485. A point equidistant from the line $4x + 3y + 2 = 0,\ 5x - 12y + 26 = 0\ and\ 7x + 24y - 50 = 0$ is

$(1,\ -1)$ b. $(1, 1)$ c. $(0, 0)$ d. $(0, 1)$

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486. Find the ratio in which the line $3x + 4y + 2 = 0$ divides the distance between the lines $3x + 4y + 5 = 0 and 3x = 4y - 5 = 0.$

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487. The coordinates of the foot of the perpendicular from the point (2,3) on the line $x + y - 11 = 0$ are $(- 6, 5)$ b. $(5, 6)$ c. $(- 5, 6)$ d. $(6, 5)$

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488. Find the image of the point $(4, \ - 13)$ in the line $5x + y + 6 = 0.$

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Others

1. Show that the diagonals of the parallelogram whose sides are $lx + my + n = 0, lx + my + n' = 0, mx + ly + n = 0$ and $mx + ly + n' = 0$ include an angle $\pi/2$.

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2. Show that the area of the parallelogram formed by the lines $2x - 3y + a = 0, \quad 3x - 2y - a = 0, \quad 2x - 3y + 3a = 0$ and $3x - 2y - 2a = 0$ i s $\frac{2a^2}{5}$ square units dot`

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3. If the lines $x + q = 0 \, and \, 3x + 2y + 5 = 0$ are consonants then the value of q will be 1 b. 2 c. 3 d. 5

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