



MATHS

BOOKS - NAGEEN PRAKASHAN ENGLISH

STRAIGHT LINES

Example

1. At which point should the origin be shifted so that co-ordinates

of point (2, 5) become (1, -4)?



2. If origin is shifted to the point (2, 3) then what will be the transformed equation of the straight line 2x - y + 5 = 0 in the



3. If origin is shifted to the point (-1,2) then what will be the transformed equation of the curve $2x^2 + y^2 - 3x + 4y - 1 = 0$ in the new axes ?

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4. If origin is shifted to the point (a, b) then what will be the

transformed equation of the curve $\left(x-a
ight)^2+\left(y-b
ight)^2=r^2$?

5. Find a point at which origin is shifted such that transformed equation of $x^2 + xy - 3x - y + 2 = 0$ has no first degree term and constant term. Also find the transformed equation.

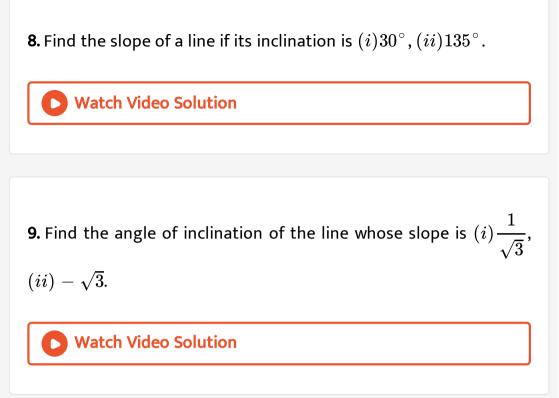
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6. Find a point at which origin is shifted such that transformed equation of $2x^2 + y^2 - 12xy + 16 = 0$ has no term containing xand constant term.

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7. Prove that the area of a triangle is invariant under the translation of the axes.





10. Find the slope of the lines passing through the following points :

(i)(0,3) and (5,1)

 $(ii)(\,-1,\,2)$ and $(2,\,5)$

11. If the slope of a line passing through the points (x, 1) and (-3, 5) is $\frac{4}{3}$, find the value of x.



12. Find the angle between the line joining the points $(\,-1,3)$ and

(-2,4) and X-axis.

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13. Show that the line joining the points (4, 5) and (1, 2) is parallel

to the line joining the points (9, -2) and (12, 1).

14. Show that the line joining the points (2, -6) and (-4, -8) is perpendicular to the line joining the points (4, -2) and (6, -8).

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15. If the points A(1,3), $B(\,-2,1)$, C(x,2) and $D(\,-1,5)$ are

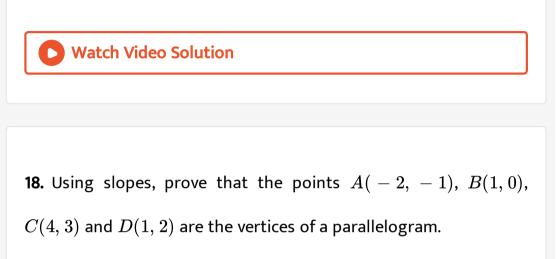
given and AB is perpendicular to CD, find the value of x.

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16. Without using Pythagoras theorem, show that the points A(2, 1), B(5, 4) and C(3, 6) are the vertices of a right-angled triangle.



17. If the points P(1, 5), Q(-1, 1) and R(4, y) are collinear, find the value of y.



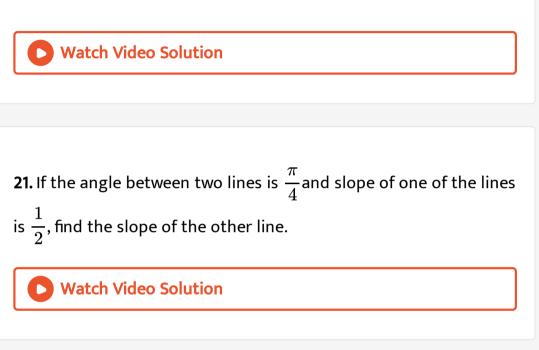
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19. If three points A(h, 0), P(a, b) and B(0, k) lie on a line, show

that:
$$rac{a}{h}+rac{b}{k}=1.$$

20. The slopes of two lines are $\frac{1}{2}$ and 3. Find the angle between

them.

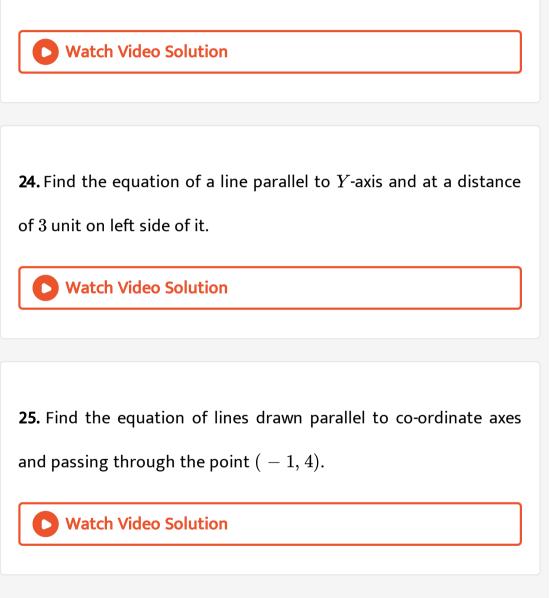


22. In Figure, time and distance graph of a linear motion is given. Two positions of time and distance are recorded as, when T = 0, D = 2 and when T = 3, D = 8. Using die concept of slope, find law of motion, i.e., how distance depends upon time.



23. Find the equation of a line parallel to X-axis and 5 unit above

it.



26. Find the equation of a line passing through the point (− 1, 3) and whose slope is 1/3.
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27. Find the equation of a line passing through the point (2, − 3) and makes an angle of 45° from X-axis.
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28. Find the equation of a line passing through the points (2, 5) and (-3, 1).



29. Prove that the points A(4, 1), B(-2, 3) and C(-5, 4) are collinear. Also find the equation of the line passing through these points.

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30. Find the equation of the sides of ΔABC whose vertices are

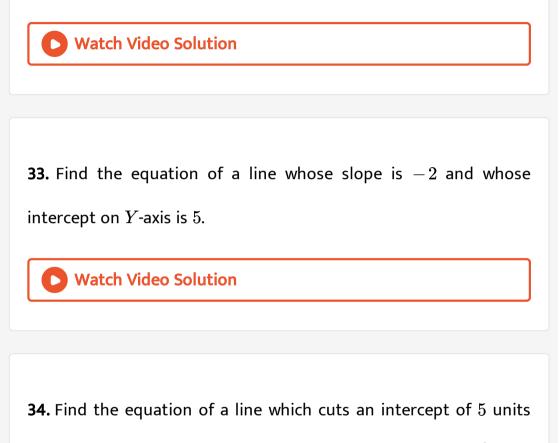
A(2, -3), B(0, 1) and C(4, 2).



31. The co-ordinates of the vertices of ΔABC are A(-2,4),

 $B(5,\,5)$ and $C(4,\,-2).$ The equation of the bisector of igta A is :

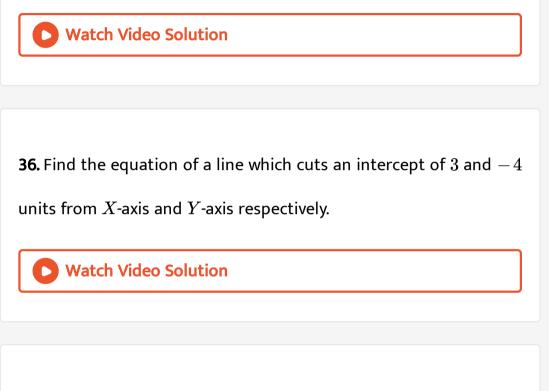
32. Find the equation of the perpendicular bisector of the line joining the points (1, 3) and (-2, 6).



from negative direction of Y-axis and makes an angle of 135^0 from

the positive direction of X-axis.

35. Find the equation of a line whose slope is 3 intersects X-axis on left side at a distance of 2 untis from origin.



37. Find the length of intercepts cuts on axes from the line 4x - 5y = 20.

38. Find the equation of a line which passes through the point (5, 1) and cuts, equal in magnitude but opposite in sign, intercepts on axes.

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39. Find the equation of line which passes through the point (2,3)

and the sum of whose intercepts on axes is 10.

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40. If the mid-point of the line segment between the axes of a line

is (p, q) then find the equation of the line.

41. Find the area of triangle formed by the line ax + by = 2ab and

the co-ordinate axes.



42. Find the equation of a line which is at a distance of 5 units from origin and the perpendicular from origin to this line makes an angle α from the positive direction of X-axis where $\tan \alpha = \frac{4}{3}$.



43. Find the equation of a line which is at a distance of 5 units from origin and the perpendicular from origin to this line makes an angle of 30° from the positive direction of X-axis.



44. Find the length of intercepts cuts on axes from the line $x \sin \alpha + y \cos \alpha = \sin 2\alpha$ and the co-ordinates of the mid-point of the line segment lies between the axes.

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45. Prove that the equation of a line passes through the point $(a\cos^3 \alpha, a\sin^3 \alpha)$ and perpendicular to the line $x\tan \alpha + y = a\sin \alpha$ is $x\cos \alpha - y\sin \alpha - a\cos 2\alpha$.

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46. Find the co-ordinates of the foot of perpendicular drawn from

the point (3, -3) to the line x - 2y = 4.



47. The fahrenheit 'F' and Kelvin 'K' temperatures show a linear relation. If at F = 32, K = 273 and at F = 212, K = 373, then find K in terms of F. Also find the value of F when K = 0.

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48. Assuming that straight lines work as the plane mirror for a point, find the image of the point (1, 2) in the line x - 3y + 4 = 0.

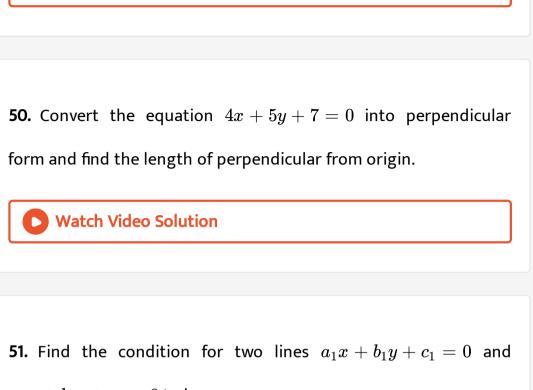


49. The equation of a line is 3x + 4y - 10 = 0. Convert this equation into :

(i) slope-intercept

(ii) intercept

(iii) perpendicular form



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a_2x+b_2y+c_2=0 to be
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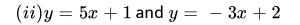
(i) parallel

(ii) perpendicular



52. Find the angle between the following pairs of lines :

(i)x+2y-1=0 and 2x-y+3=0





53. Find the angle between the following pairs of lines :

(i)x+2y-1=0 and 2x-y+3=0

(ii)y=5x+1 and $y=\ -3x+2$

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54. Find the equation of a line passing through the intersection of

the lines x + 3y = 4 and 2x - y = 1 and (0, 0) lies on this line.



55. If the lines y = x + 1, y = 2x and y = kx + 3 are concurrent

find the value of 'k'.

56. Find the equation of a line passing through the intersection of the lines 3x + 2y = 5 and 2x - y = 1 and cuts equal intercepts on the axes.

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57. Find the equation of a line passes through the point (1, 3) and

parallel to the line 3x - 5y + 7 = 0.

58. Find the equation of a line, passes through (-1, 2) and perependicular to the line 2x + 3y = 1.

59. Find the equation of a line perpendicular to the line $\frac{x}{a} + \frac{y}{b} - 1$ and passes through the mid-point of the line segment lying between the axes of the given line.



60. Two lines pass through the point (3,1) meet an angle of 60° . If

the slope of one line is 2, find the equation of second line.

61. Find the length of perpendicular from point (3, -2) to the line 3x - 4y - 2 = 0.



62. Find the equation of a line passes through the points (4, 3) and (3, 2). Also find the length of perpendicular from point (-1, 5) to this line.

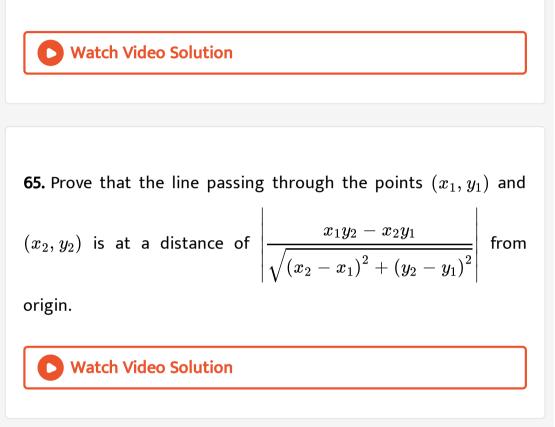
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63. Find the distance between the parallel lines 3x + 4y - 7 = 0

and 3x + 4y + 8 = 0.

64. If the lines 3x + by - 1 = 0 and ax - 5y + 2 = 0 are parallel,

then find the relation between a and b.



66. Find perpendicular distance from the origin of the line joining

the points $(\cos \theta, \sin \theta)$ and $(\cos \varphi, \sin \varphi)$.



67. Find the equation of a line passing through the intersection of the lines y = 2(x - 1) and y = 3x - 5 and which is at a distance of $\frac{7}{\sqrt{2}}$ units from origin.

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

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69. If p is the length of perpendicular from point (1, 1) to the straight line ax + by + a + b = 0, then prove that :

$$p^2=4+rac{8ab}{a^2+b^2}$$

70. Prove that the locus of a moving point, which is equidistant from the lines 3x - 2y = 5 and 3x + 2y = 5, is a straight line.

71. Find the equation of a line which passes through the point (1, 1) and through the intersection of lines x + y - 1 = 0 and 3x + 2y + 1 = 0.



72. Find the equation of a line which passes through the intersection of lines 2x + y - 1 = 0 and x - 3y + 1 = 0 and parallel to *x*-axis.



73. Find the equation of a line which passes through the intersection of the lines 3x + y - 2 = 0 and x - y + 1 = 0 and parallel to *Y*-axis.

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74. Find the equation of a line passing through the point of intersection of the lines x + 3y + 1 = 0 and 2x - y + 3 = 0 and parallel to the line 3x - 2y + 1 = 0.

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75. Find the equation of a line passing through the point of intersection of lines x - y - 1 = 0 and 2x - 3y + 1 = 0 and perpendicular to the line x - 2y + 5 = 0.

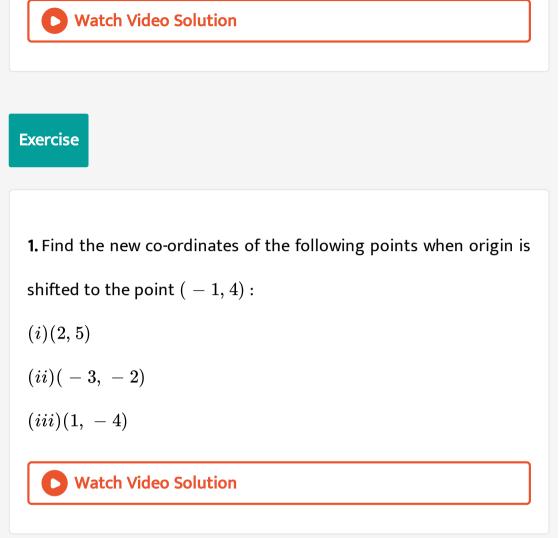
76. Show that the lines represented by x(a + 3b) + y(2a - b) = 5a + b pass through a fixed point for different values of a and b.

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77. Find the equation of the line passing through the point of intersection of the lines 4x - 7y - 3 = 0 and 2x - 3y + 1 = 0 that has equal intercept to axes.

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78. 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 $\sqrt{5}$



2. At which point the origin should be shifted such that the new co-ordinates of the (-2, 3) becomes (2, 6) ?



3. If the origin is shifted to the point (1, 2) then what will be the transform equation of the following equations, it is given that the new and old axes are parallel : $(i)x^2 + y^2 - 2x - 4y = 0$ $(ii)2x^2 - y^2 - 4x + 4y - 3 = 0$ $(iii)x^2 + xy - 2y^2 - 4x + 7y - 5 = 0$ (iv)3x + y = 6

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4. Find the point at which origin is shifted such that the transformed equation of $x^2 + 2y^2 - 4x + 4y - 2 = 0$ has no first degree term. Also find the transformed equation .

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5. Find the point at which is shifted such that the transformed equations of the following equations has no first degree term :

$$egin{aligned} (i)2x^2+3y^2+4x-12y+10&=0\ (ii)x^2+y^2-xy-5x+4y+5&=0 \end{aligned}$$

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6. Shift the origin to a suitable point so that the equation $y^2 + 4y + 8x - 2 = 0$ will not contain term n y and the constant term.

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7. Show that the area of triangle whose vertices are (1, 0), (2, 4) and (3, 3) will not change on shifting the origin to the point (-2, 3).

8. Find the slope of the lines whose iclination is given :

(i)
$$45^{\circ}$$
 (ii) 60° (iii) 120°
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9. Find the inclination of the lines whose slopes are as follows :
(i) $\sqrt{3}$ (ii) 1 (iii) $-\frac{1}{\sqrt{3}}$
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10. Find the slopes of the lines passing through the following points :
(i) (1, 5) and (3, 2)
(ii) (-4, 3) and (-6, 3)
(iii) (1, 3) and (1, 4)
(iv) (2, -1) and (3, 2)

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11. If the slope of a line passing through the points (1, 4) and (x, 2) is 2, find the value of x.

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12. If the angle of inclination of line joining the points (x,3) and

 $(\,-2,\,5)$ is $45^{\,\circ}$, find the value of x.



13. If the slop of line joining the points (6, -3) and (x, 7) is 2, find the values of x.



14. Show that the line joining the points $(4,\ -1)$ and (-3,3) is

parallel to the line joining the points (8, 0) and (1, 4).



15. If the line joining the points (5, y) and (4, 9) is parallel to the

line joining the points (0, 5) and (1, 7), find the value of y.

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16. Show that the line joining the points (4, -3) and (0, 7) is

perpendicular to the line joining the points (5, 2) and (0, 0).



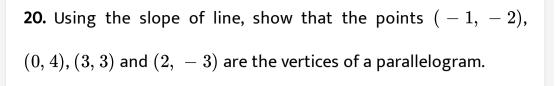
17. If the line joining the points (6, -2) and (8, 4) is perpendicular to the line joining the points (12, 8) and (24, y), find the value of y.

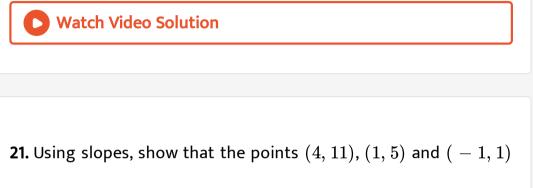
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18. Without using Pythagoras theorem, show that A(4, 4), B(3, 5) and C(-1, -1) are the vertices of a right angled triangle.

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19. Using slopes, show that the points A(0,5), B(3,2) and C(-1,6) are collinear.





are collinear.

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22. If the points (-1, y), (1, 2) and (5, 4) are collinear, find the

value of y.

23. 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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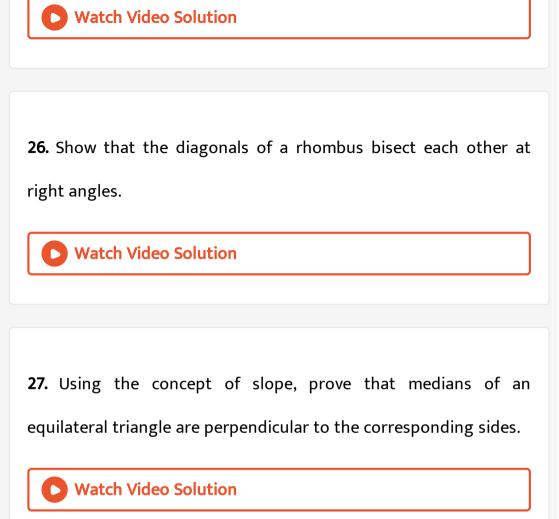
24. If A(1,2), B(-3,2) and C(3,-2) are the vertices of ΔABC , show that :(i) an A = 2

$$(ii) an B=rac{2}{3}\ (iii) an C=rac{4}{7}$$

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25. 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.



28. Prove that the line joining the mid-points of the two sides of a

triangle is parallel to the third side.



29. Find the equation of the following lines :

- (i) parallel to X-axis and 2 units above it.
- (ii) parallel to X-axis and 3 units below it.
- (iii) parallel to Y-axis and 6 units left of it.
- (i) parallel to Y-axis and 4 units right of it.



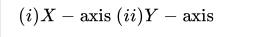
30. Find the equation of a line which pasess through the point

- $(1,\ -1)$ and parallel to
- $(i)X ext{axis} (ii)Y ext{axis}$

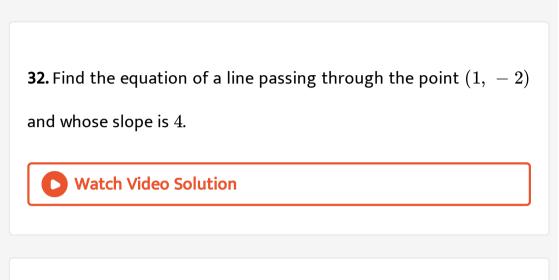


31. Find the equation of line passing through the point (2, 6) and

perpendicular to



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33. Find the equation of a line passing through the point (-2, 0) and makes an angle of $\frac{2\pi}{3}$ from the positive direction of X – axis.



34. Find the equation of a line passing through the point (0, -2)

and makes an angle of 75° from the positive direction of X-axis.



35. (*i*)Find the equation of a line passing through origin and makes an angle of 60° from the positive direction of X-axis.

(ii) Find the equation of a line for which an heta = 2 and the length of intercept on X-axis is 3 units.

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36. (*i*) Find the equation of line passing through (2, 2) and makes an angle of 135° from positive direction of X-axis.

(*ii*) Find the equation of a line passing through the point (2, 1) and makes an angle ' θ ' from the positive direction of X-axis where $\cos \theta = -\frac{1}{3}$.

37. Find the equation of the line passing through the following points :

(i)(1,2) and (4,7)

 $(ii)(\,-3,1)$ and (0,3)

(iii) origin and (1,4)

 $(iv)(\,-\,2,\,-\,3)$ and $(1,\,2)$



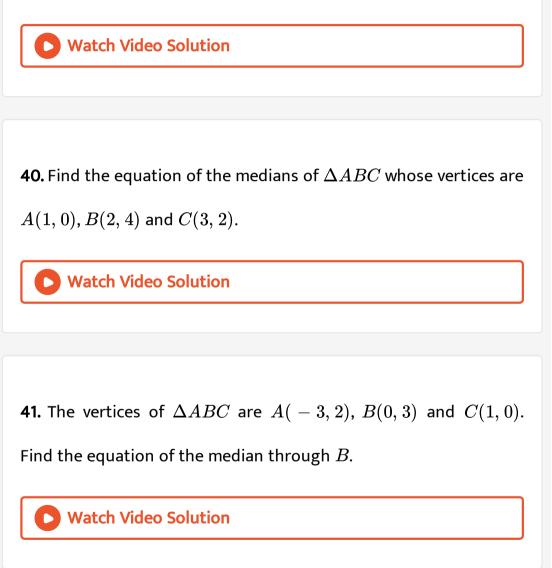
38. (*i*) Find the equation of a line passing through the points (a, b) and (ab, b^2) .

(ii) The vertices of ΔABC are A(2,5), B(3,2) and C(5,6). Find

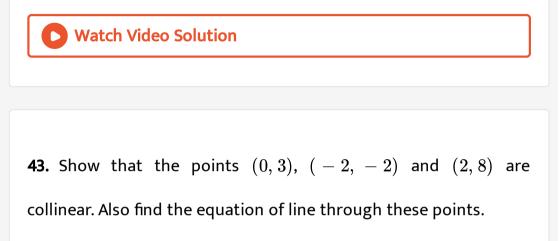
the equation of the bisector of $\angle A$.



39. If the point (p,q) lies on the line joining the points (-4,5)and (-5,7), then show that 2p + q + 3 = 0.



42. Find the equation of the perpendicular bisector of the line segment joining the points (1, 0) and (3, 5).



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44. Find the equation of a line whose

(*i*) Slope
$$= -1$$
 and Y - intercept $= 3$.
(*ii*) Slope $= \frac{2}{5}$ and Y - intercept $= -2$.

$$(iii)$$
 Slope $= rac{1}{3}$ and $Y - ext{ intercept } = rac{2}{3}.$

45. Find the equation of a line which intersects Y-axis at a distance of 4 units above origin and makes an angle of 45° from positive direction of X-axis.

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46. Find the $Y-$ intercept of the line $2y=4x-3.$	

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47. Find the equation of a line which intersects X-axis at a distance of 2 units on right of origin and makes an angle of 30° from positive direction of X-axis.



48. Find the equation of lines whose X and Y-intercepts are as

follows :

(i) 2 and 3 (ii) -2 and -5(iii) 3 and -5(iv) 4 and -2`

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49. Find the intercepts cuts on X-axis and Y -axis from the following lines :

 $(i)3x + 4y = 12 \ (ii)2x - 5y = 8$

 $(iii)x+2y+3=0\,(iv)2x-y+3=0$

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50. Find the equation of a line which passes through the point

(1, 3) and makes equal intercepts on X and Y-axis.

51. Find the equation of a line which passes through (-3, 2) and makes intercepts equal in magnitude but opposite in sign on X and Y-axis.

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52. Find the equation of a line passes through (3,4) and the ratio

of its intercepts on X and Y-axis is 3:2.

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53. Find equation of the line passing through the point (2, 2) and

cutting off intercepts on the axes whose sum is 9.



54. (i) Find the intercepts made by line 5x - 2y = 10 on both axes. Also find the length of segment between the axes made by lines.

(*ii*) Find the equation of a line whose X and Y intercepts are respectively 3 and 4 times of the intercepts of the line 2x + 3y = 6.

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55. (*i*) Find the equation of a line, in which the mid- point of the line segment between the axes is (-3, 2).

(ii) Find the area of triangle formed by the line 4x+3y=24 and

the co-ordinate axes.



56. Find the equation of a line whose segment between the axes is

divided in the ratio 2:3 by the point (h, k).



57. Find the equation of a line which is at a perpendicular distance of $\sqrt{2}$ units from origin and the perpendicular from origin to this line makes an angle of 135° from positive direction of X-axis.



58. Find the equation of a line which is at a distance of 2 units from origin and the perpendicular from origin to this line makes an angle $\tan^{-1} \frac{12}{5}$ from positive direction of X-axis.

59. Find the equation of a line which is at a distance of 4 units from origin and the slope of perpendicular from origin to this line is $\frac{1}{\sqrt{3}}$.

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60. Find the equation of a line which makes a triangle of area $96\sqrt{3}$ square from co-ordinate axes and the perpendicular drawn from origin to this line makes an angle 60° from X-axis.



61. Convert the line 3x - 4y + 5 = 0 into perpendicular form and

find the length of perpendicular from origin to this line.

62. Convert the following equations into slope-intercept form and

find their slope and y-intercepts.

 $(i)5x+12y=26\,(ii)6x-8y+5=0$



63. Convert the following equations into intercept form and find the intercepts cuts from axes from these lines :

$$(i)4x+3y=24\,(ii)2x-7y=14$$

$$(iii)2x + 3y = 6 \ (iv)3x - y = 4$$

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64. Convert the following equations into perpendicular form and find the length of perpendicular from origin and the angle

between x-axis and the perpendicular from origin :

$$(i)\sqrt{3}x-y=8\,(ii)2x+y\sqrt{5}=6$$

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65. Find the angle formed by the line $\sqrt{3}x + y - 5 = 0$ from the

positive direction of x-axis.

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66. Find angles between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$.

67. Find the equation of a line passes through the points (3, 4) and parallel to the line x + 5y = 1.

68. Find the equation of a line passes through the point (-2, 1)

and perpendicular to the line 3x + y = 5.

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69. Prove that the lines 2x + 5y = 8 and 4x + 10y - 1 = 0 are

parallel.

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70. Prove that the lines x + 3y + 2 = 0 and 3x - y = 0 are

perpendicular.

71. Find the angle between the following pairs of lines :

$$(i)y=\sqrt{3}x+1$$
 and $y=rac{1}{\sqrt{3}}x+2$

$$(ii)y=x$$
 and $y=1-x$

$$(iii)2x+3y=2$$
 and $3x-2y=1$.

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72. Find the slope of a line perpendicular to the line 3x + 5y = 8.



73. If a line passes through the points (a, 1) and (3, -5), meets

the line 3x + y - 1 = 0 at right angle, then find the value of 'a'.

74. Find the point of intersection of the following pair of lines :

$$(i)9x-10y=12$$
 and $2x-5=0$

$$(ii)y=m_1x+c_1$$
 and $y=m_2x+c_2$

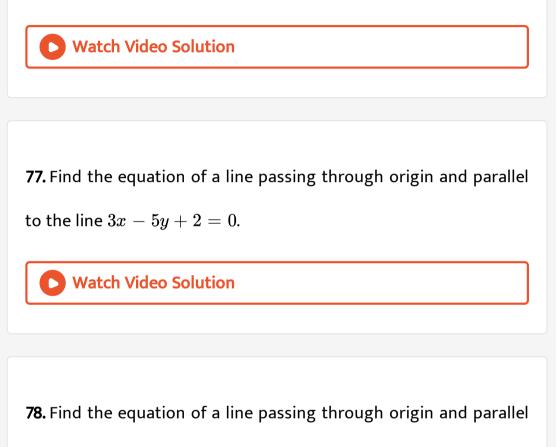
(iii)x+y=8 and x-y=2

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75. (i) Find the value of 'a' if the lines 3x - 2y + 8 = 0, 2x + y + 3 = 0 and ax + 3y + 11 = 0 are concurrent. (ii) If the lines $y = m_1x + c_1$, $y = m_2x + c_2$ and $y = m_3x + c_3$ meet at point then shown that :

$$c_1(m_2-m_3)+c_2(m_3-m_1)+c_3(m_1-m_2)=0$$

76. Find the equation of line joining origin to the point of intersection of the pair of lines 3x + y = 10 and x - y = 2.



to the line joining the points (1, 3) and (2, -1).

79. Find the equation of a line passing through the point (-1, -2) and parallel to the line joining the points (2, -3) and (3, -2)

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80. Find the equation of a line passing through the intersection of

the lines 3x - y = 1 and 5x + 2y = 9 and parallel to the line

3x + 5y = 8.

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81. Find the equation of a line parallel to the line $x \cos \alpha + y \sin \alpha = p$ and passing through the mid-point of the line segment joining the points (1, 5) and (3, -3).

82. Find the equation of a line passing through the point (-1, 0)

and perpendicular to the line x + 5y = 4.

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83. Find the equation of perpendicular bisector of line segment

joining the points (1,5) and (3, -1)



84. Find the equation of a line passing through the point of intersection of the lines 3x + 5y = -2 and 5x - 2y = 7 and perpendicular to the line 4x - 5y + 1 = 0.

85. Find the length of perpendicular drawn from point (2, -1) to

the line 3x + 4y - 11 = 0.



86. Find the length of perpendicular drawn from origin to the line

12x - 5y = 26.

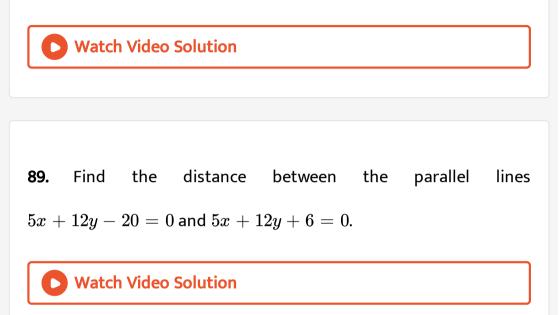
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87. Find the length of perpendicular from the point (-1, -2) to

the line x = 2y - 15.



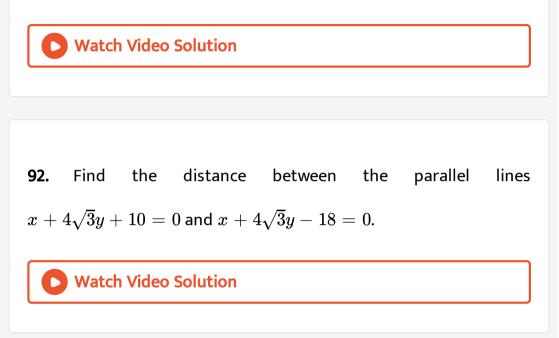
88. Find the length of perpendicular from origin to the line $x+7y+4\sqrt{2}=0.$



90. The co-ordinates of the foot of perpendicular drawn from origin to a line are (2, 3). Find the equation of the line.



91. Find the length of perpendicular from the point $(a \cos \alpha, a \sin \alpha)$ to the line $x \cos \alpha + y \sin \alpha = p$.



93. Find the relation between a and b if the lines 3x - by + 5 = 0

and ax + y = 2 parallel.



94. If p and q are the lengths of perpendiculars from the origin to the lines $x \cos \theta - y \sin \theta = k \cos 2\theta$ and $x \sec \theta + y \csc \theta = k$, respectively, prove that $p^2 + 4q^2 = k^2$.

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95. Show that the distance between the parallel lines
$$ax + by + c = 0$$
 and $k(ax + by) + d = 0$ is $\left| \frac{c - \frac{d}{k}}{\sqrt{a^2 + b^2}} \right|$

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96. If the length of perpendicular from origin to the line ax + by + a + b = 0 is p, then show that :

$$p^2-1=rac{2ab}{a^2+b^2}$$

97. The equations of sides AB, BC and AC of ΔABC are respectively y = x, y = 0 and 4x + 3y = 12, then find : (*i*) length of perpendicular from B to AC

 $(ii) \angle BAC.$

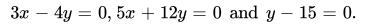
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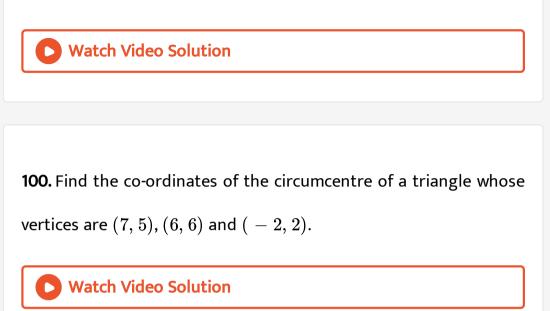
98. If p is the length of perpendicular from the origin to the line whose intercepts on the axes are a and b, then show that $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.



99. Find the coordinates of the incentre and centroid of the

triangle whose sides have the equations





101. Find the co-ordinates of the orthocentre of a triangle whose vertices are (3, -1), (-1, 2) and (0, 0).



102. The equation of one diagonal of a square is 2x + y = 6 and its one vertex is (4, 3). Find the equation of other diagonal. **103.** The co-ordinates of the vertex of an equilateral triangle are (2, -1) and equation of its base is x + y - 1 = 0. Find the equations of its other two sides.

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104. A ray of light is rent 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 containing the reflected ray.



105. Find the equation of the straight line through the origin making angle lpha with the line y=mx+b .



106. 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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107. Find the equation of a line passing through the point of intersection of the lines 2x - 7y + 11 = 0 and x + 3y = 8 and passes through the point (2, -3).

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108. Find the equation of a line passing through the point of intersection of the lines 4x + 3y - 1 = 0 and x + 2y + 3 = 0 and

(i) parallel to X-axis.

(ii) parallel to Y-axis.

parallel to line 2x + y - 1 = 0.

(iv) perpendicular to line 3x - y + 1 = 0.

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109. Find the equation of line passing through the point of intersection of the lines 2x + 3y + 1 = 0 and 3x - 5y - 5 = 0

(i) perpendicular to X-axis.

(ii) perpendicular to Y-axis.

(iii) perpendicular to line x-2y+1=0

(iv) parallel to line x + 2y - 1 = 0.

110. Find the equation of a line passing through the point of intersection of the lines x + y = 4 and 2x - 3y - 1 = 0 and parallel to a line whose intercepts on the axes are 4 and 6 units.

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111. Find the equation of a line passing through the point of intersection of the lines 5x + y - 3 = 0 and x + 3y + 1 = 0 and made equal intercept from the co-ordinates axes.

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

B. - 6

C.4

D. 6

Answer: B



113. The co-ordinates of the vertices of ΔABC are A(-2, 4), B(5,5) and C(4, -2). The equation of the bisector of $\angle A$ is :

A. x + 3y = 10

B. x - 3y = 10

C.3x + y = 10

D. 3x - y = 10

Answer: A



114. Find the equation of a line which passes through the point (5, 1) and cuts, equal in magnitude but opposite in sign, intercepts on axes.

A. x + y = 6

B. 2x + y = 11

C. 2x - y = 9

D.
$$x - y = 4$$

Answer: D



115. The co-ordinates of three vertices of a parallelogram ABCD are A(1,0), B(3,4) and C(1,2). The co-ordinates of fourth vertex D are :

A. (-1, 2)B. (-5, -4)C. (-1, -2)D. (2, 0)

Answer: C

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116. The perpendicular drawn from origin to the line y=mx+c meets the line at point $(\,-1,\,-2)$, $(c,m)=\,?$

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

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

D. None of these

Answer: A



117. The perpendicular distance between the lines 3x + 4y = 6and 3x + 4y + 4 = 0 is :

A.1 unit

 $\mathsf{B.}\,2\,\mathsf{units}$

C. 3 units

D. None of these

Answer: B

118. The equation of the perpendicular bisector of line AB is x + 2y = 8 and the co-ordinates of point A are (1, 1). Co-ordinates of B are :

- A. (0, 2)
- B.(1,3)
- C.(3,5)
- D.(2,5)

Answer: C



119. Equation of a line passing through the point (2, 3) and perpendicular to the line x + y + 1 = 0 is :

A. y - x + 1 = 0

B. x - y + 1 = 0

C. x + y - 1 = 0

D. None of these

Answer: B

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120. In what ratio, the line joining (1, 1) and (5, 7) is divided by the

line x + y = 4?

A. 3:2

B. 2:3

C. 1: 2

 $\mathsf{D}.\,2\!:\!1$

Answer: C

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

A. (1, 4)

- B. (-1, -4)
- C.(1, -4)
- D. (-1, 4)

Answer: B

122. The locus of the points of intersection of the lines $x \cos \theta + y \sin \theta = a$ and $x \sin \theta - y \cos \theta = b$, (θ = variable) is :

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

B.
$$x^2 + y^2 = a^2 - b^2$$

- $\mathsf{C}.\,x^2+y^2=2\bigl(a^2+b^2\bigr)$
- D. None of the above

Answer: A

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123. A straight line through the point (2,2) intersects the lines $\sqrt{3}x + y = 0$ and $\sqrt{3}x - y = 0$ at thep points A and B,

respectively. Then find the equation of the line AB so that triangle OAB is equilateral.

A. x=2

B. x + y = 4

C. y = 2

D. None of these

Answer: C

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124. The triangle formed by the straight lines x = y, x + y = 4

and x + 3y = 4 is :

A. isosceles

B. equilateral

C. right-angled

D. None of these

Answer: c

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125. The lines

are

px+qy+r=0, qx+ry+p=0, rx+py+q=0,

concurrant then

A. p+q+r=pqrB. $p^3+q^3+r^3=3pqr$ C. $p^2+q^2+r^2=2(pq+qr+rp)$

D. None of these

Answer: B

126. Find the point of intersection of the following pairs of lines:

$$bx + ay = ab \ and \ bx + ay = ab$$
.

A.
$$x = y + 4$$

B. $(lx + my)(a + b) = (l + m)ab$
C. $(x + y)(a + b) = 2ab + 2$
D. $(lx - my)(a - b) = (l - m)ab$

Answer: B

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127. The area of triangle formed by the straight lies y=1,

$$2x+y=2$$
 and $2x-y+2=0$ is ,

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

- B. 4 sq. units
- C. 2 sq. units

D. None of these

Answer: A



128. If the equation of the base of an equilateral triangle is x + y = 2 and the vertex is (2, -1) then find the length of the side of the triangle.

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

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

D. None of these

Answer: B



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

A. 1/3

B. 2/3

 $\mathsf{C.}\,4/3$

D. None of these

Answer: C

130. Write the coordinates of the orthocentre of the triangle formed by points (8,0), (4,6) and (0,0)

A. (0, 1)

- B. (0, 0)
- C.(1,1)
- D. (1, -1)

Answer: D



131. If the line y = mx, meets the lines x + 2y = 1 and 2x - y + 3 = 0 at one point only then m = ?

B.-1

 $\mathsf{C}.-2$

D. None of these

Answer: B

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132. Draw a quadrilateral in the Cartesian plane, whose vertices are

(-4, 5), (0, 7), (5, -5)and (-4, -2). Also, find its area.

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133. The base f an equilateral triangle with side 2a lies along the yaxis such that the mid point of the base is at the origin. Find the vertices of the triangle.



134. Find the distance between $P(x-1, y_1)$ and $Q(x_2, y_2)$ when

i. PQ is parallel to the y-axis ii. PQ is parallel to the x-axis.

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135. Find a point on the x-axis, which is equidistant from the point (7,6) and (3,4).



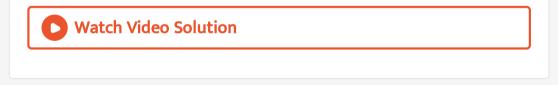
136. Find the slope of a line, which passes through the origin, and the mid-point of the line segment joining the points P(0, -4) and B(8, 0)[`].

137. 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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138. Find the slope of the line, which makes an angle of 30^o with

the positive direction of y-axis measured anticlockwise.



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

140. Without using distance formula, show that points (-2, -1), (4, 0), (3, 3), and (-3, 2) are the vertices of a parallelogram.

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



142. The slope of a line is double of the slope of another line. If tangents of the angle between the is find the slopes of the other line.



143. A line passes through (x_1,y_1) and (h,k). If slope of the line is m, show that $k-y_1=m(h-x_1).$

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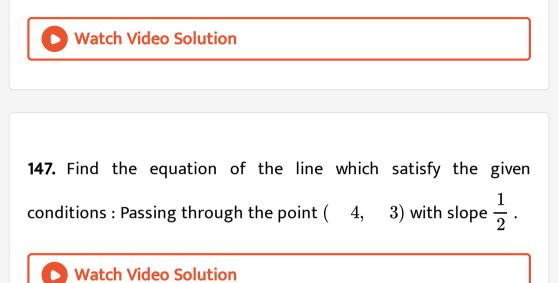
144. If three points A(h, 0), P(a, b) and B(0, k) lie on a line, show that: $\frac{a}{h} + \frac{b}{k} = 1$.

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145. 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.



146. Find the equation of the line which satisfy the given conditions : Write the equations for the x and y-axes.



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

 $m \cdot$



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



150. 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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151. Find the equation of the line which satisfy the given conditions

: Intersecting the yaxis at a distance of 2 units above the origin

and making an angle of 30o with positive direction of the xaxis.

152. Find the equation of the line Passing through the points (-1, 1), and (2, -4).



153. Find the equation of the line which satisfy the given conditions : Perpendicular distance from the origin is 5 units and the angle made by the perpendicular with the positive xaxis is 30o.



154. The vertices of ΔPQR are P(2, 1), Q(-2, 3), R(4, 5). Find

equation of the median through the vertex R.

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



156. A line perpendicular to the line 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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157. Find the equation of a line that cuts off equal intercepts on

the coordinate axes and passes through the point (2, 3).

158. Find equation of the line passing through the point (2, 2) and

cutting off intercepts on the axes whose sum is 9.



159. Find the equation of the line passing through the point (0,2) 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.



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



161. The length L (in centimetre) of a copper rod is a linear function

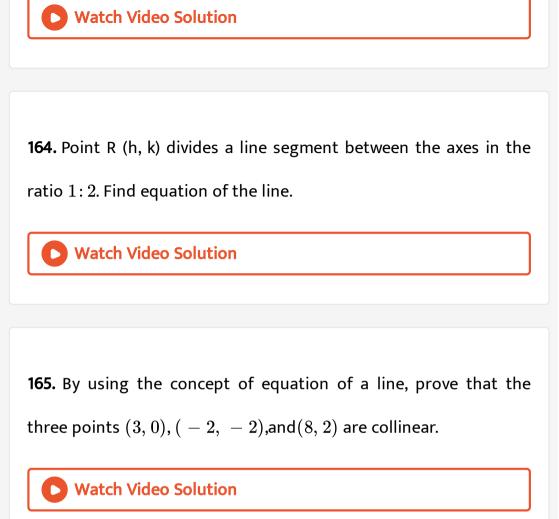
of its Celsius temperature C. In an experiment, if L = 124.942 when C = 20 and L = 125.134 when C = 110, express L in terms of C.

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162. The owner of a milk store finds that, he can sell 980 litres of milk each week a Rs. 14/litre and 1220 litres of milk each week at Rs16/litre. Assuming a linear relationship between selling price and demand, how many lire could he sell weekly at Rs17/litres?



163. P (a, b) is the midpoint of a line segment between axes. Show that equation of the line is $\frac{x}{a} + \frac{y}{b} = 2$.



166. Reduce the following equations into slope intercept form and

find their slopes and the y intercepts.(i) x + 7y = 0, (ii) 6x + 3y - 5 = 0, (iii) y = 0. **167.** Reduce the following equations into intercept form and find their intercepts on the axes.(i) 3x + 2y - 12 = 0, (ii) 4x - 3y = 6, (iii) 3y + 2 = 0.

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168. Reduce the following equations into normal form. Find their perpendicular distances from the origin and angle between perpendicular and the positive xaxis.(i) $x - \sqrt{3}y + 8 = 0$, (ii) y - 2 = 0, (iii) x - y = 4.

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169. Find the distance of the point (-1,1) from the line 12(x+6) = 5(y-2).

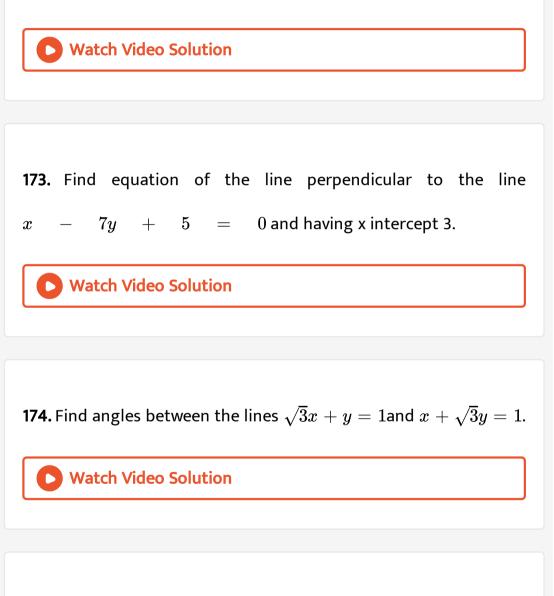
170. Find the points of the x-axis, whose distances from the line

 $rac{x}{3}+rac{y}{4}=1$ are 4 unit is.

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171.	Find	the	è	distan	ice	between	parallel	lines	(i)
15x	+	8y	_	34	=	0			and
15x	+	8y	+	31	=	0	(ii)		1
(x	+ 2	y) +	_	<i>p</i> =	=	$0 \hspace{0.1 cm} ext{and} \hspace{0.1 cm} ext{l}(x)$	+ y)	_	r = 0

172. find equation of the line parallel to the line 3x - 4y + 2 = 0and passing through the point (-2, 3).



175. The line through the points (h, 3) and (4, 1) intersects the line

7x - 9y - 19 = 0 at right angle. Find the value of A.

176. Prow that the line through the point $(x_1 > y_1)$ and parallel to

the line Ax + By + C = 0 is $A(x - x_1) + B(y - y_1) = 0$.

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177. Two lines passing through the point (2, 3) intersects each other at an angle of 60° . If slope of one line is 2, find equation of the other line.



178. Find the equation of the perpendicular bisector of the line segment joining the points (3,4) and (-1,2).

179. Find the coordinates of the foot of perpendicular from the

point (-1, 3) to the line 3x - 4y - 16 = 0.

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180. 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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181. If p and q are the lengths of perpendicular from the origin to

the line
$$x\cos(heta)-y\sin(heta)=k\cos(2 heta)$$
 and $x\sec(heta)+y\cos ec(heta)=k$ respectively , then prove that $p^2+4q^2=k^2$

182. 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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183. If p is the length of perpendicular from the origin to the line whose intercepts on the axes are a and b, then show that $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}.$

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184. Find the values of k for which the line $(k-3)x - (4-k^2)$ $y + k^2 - 7k + 6 = 0$ is (a) Parallel to the x-axis, (b) Parallel to the y-axis, (c) Passing through the origin.



185. Find the values of 6 and p, if the equation $x\cos heta-y\sin heta=p$ is the normal form of the line $\sqrt{3}x+y+2=0$.

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186. 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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187. What are the points on the yaxis whose distance from the line

 $rac{x}{3}+rac{y}{4}=1$ is 4 units.

188. Find perpendicular distance from the origin of the line joining

the points $(\cos \theta, \sin \theta)$ and $(\cos \varphi, \sin \varphi)$.

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189. 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 $3x + y = 0$.

190. 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.



191. Find the area of the triangle formed by the lines $y-x=0,\,x+y=0$ and x-k=0.



192. Find the value of p so that the three lines 3x + y - 2 = 0,

px + 2y - 3 = 0 and 2x - y - 3 = 0 may intersect at one point.

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193. If three lines whose equations are $y=m_1x+c_1, y=m_2x+c_2$ and $y=m_3x+c_3$ are concurrent, then show that $m_1(c_2-c_3)+m_2(c_3-c_1)+m_3(c_1-c_2)=0.$

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

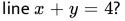
195. Find the equation of the line passing through the point of intersection of the lines 4x + 7y - 3 = 0 and 2x - 3y + 1 = 0 that has equal intercepts on the axes.

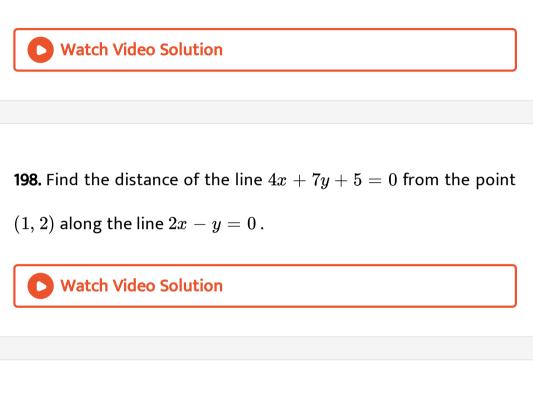
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196. Show that the equation of the straight line through the origin

angle
$$arphi$$
 with the line $y=mx+b\,israc{y}{x}=rac{m\pm tanarphi}{1\pm m\,tanarphi}$

197. In what ratio, the line joining (1, 1) and (5, 7) is divided by the





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



200. 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.

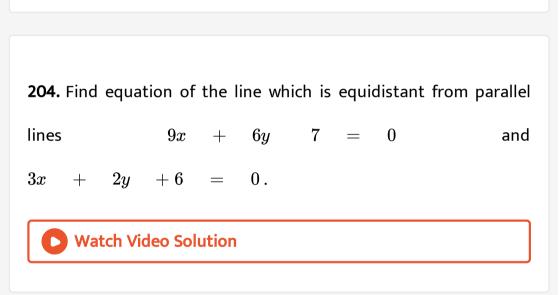


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201. Find the image of the point (3, 8) with respect to the line x + 3y = 7 assuming the line to be a plane mirror.

202. If the lines
$$y = 3x + 1$$
 and $2y = x + 3$ are equally inclined to the line $y = mx + 4$, find the value of m.

203. If sum of the perpendicular distances of a variable point P(x, y) from the lines x + y = 5 and 3x - 2y + 7 = 0 is always 10. Show that P must move on a line.



205. A ray of light passing through the point (1, 2) reflects on the xaxis at point A and the reflected ray passes through the point (5, 3). Find the coordinates of A.

206. Prove that the product of the lengths of the perpendiculars

drawn from the points $\left(\sqrt{a^2-b^2},0
ight)$ and $\left(-\sqrt{a^2-b^2},0
ight)$ to the line $rac{x}{a} \cos heta + rac{y}{b} \sin heta = 1$ is b^2 .

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207. 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.

