



MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

STRAIGHT LINES

Solved Example

1. Find the distance the points, $(2,\ -3)$ and (-6,3)

A.15 units

B.5 units

 $C.\,10 \text{ units}$

 $D.9 \mathrm{\,units}$

Answer: C



2. Using the distance formula, prove that the points A(-2,3), B(1,2) and C(7,0) are collinear.

3. Prove that the points (0,5), (-2,-2),(5,0) and (7,7) are the vertices of a

rhombus

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4. Find the area of the triangle whose vertices are A(4, 4), B(3, -16) and C(3, -2)

A. 9sq. units

B. 7sq. units

C. 5sq. units

D. 4sq. units

Answer: B



5. Find the coordinates of the point which divides the line segment joining the points A(5, -2) and B(9, 6) in the ratio 3:1

- A.(8,4)
- B. (2, 4)
- C.(7, -4)
- D.(7,5)

Answer: A

6. Find the coordinates of the midpoint of the ilne segment joining the

points, A(-2, -5) and B(3, -1)

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

x + y = 4?

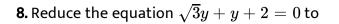
A. 2:7

B.1:3

C.1:2

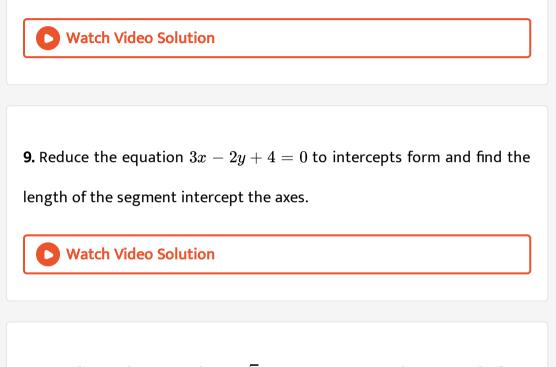
 $\mathsf{D}.\,3\!:\!2$

Answer: C



(i) slope-intercept form and final the slope and y-intercept.

(ii) intercepts form and find the intercepts on the axes.

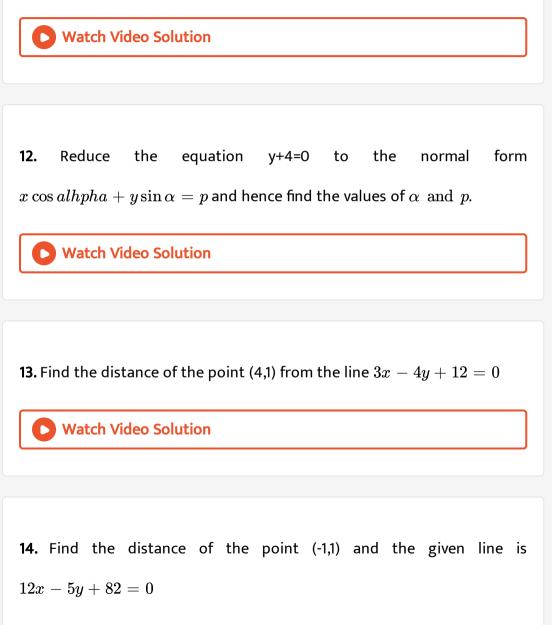


10. Reduce the equation $\sqrt{3}+y+2=0$ to the normal form

 $x \cos \alpha + y \sin \alpha = p$, and hence find the value of α and p.



11. Reduce the equation $\sqrt{3} + y + 2 = 0$ to the normal form $x \cos \alpha + y \sin \alpha = p$, and hence find the value of α and p.



15. Find the length of the perpendicular from the point (a,b) to the line

$$\frac{x}{a} + \frac{y}{b} = 1$$
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16. Find the length of the perpendicular from the origin to the line 4x+3y-

2=0

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17. 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 $rac{1}{p^2}=rac{1}{a^2}+rac{1}{b^2}.$

18. Find the perpendicular distance of line joining the points $A(\cos\theta, \sin\theta)B(\cos\phi, \sin\phi)$ from the origin



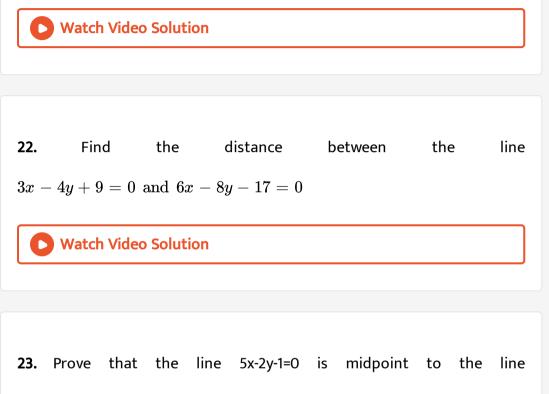
19. If p_1 and p_2 are the lengths of the perpendicular form the orgin to the line $x \sec \theta + y \cos ec\theta = a$ and $x \cos \theta - y \sin \theta = a \cos 2\theta$ respectively then prove that $4p_1^2 + p_2^2 = a^2$

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20. What are the points on the y-axis whose perpendicular distance from

the line $rac{x}{3} - rac{y}{4} = 1 ext{ is } 3 ext{ units}$

21. Find the distance between the parallel line 15x+8y-34=0 and 15x+8y+31=0.



$$5x - 2y - 9 = 0$$
 and $5x - 2y + 7 = 0$

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

25. 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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26. If the given be shifted to the point (2,-3) by a translation of coordinate

axes, find the new coordinates of the point (4,7).



27. If the origin is shifted to the point (2,3) the coordinates of a point

become (5,-4). Find the original coordinates, which the axes are parallel.

28. The coordinates of the point (4, 5) in the new system, when its origin

is shifted to (3,7) are



29. Find the transformed equation of the straight line $2x \setminus 3y + \setminus 5 \setminus = \setminus 0$, when the origin is shifted to the point $(3, \setminus 1)$ after translation of axes.

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30. Find the point to which the origin should be shifted after a translation of axes so that the following equations will have no first degree term: $y^2 + x^2 - 4x - 8y + 3 = 0$



31. Find the equation of the line drawn through the point interseciton of

the line 4x-3y+7=0 and 2x+3y+5=0 and passing through the point (-4,5).



32. Find the equation of the line through the intersection of lines 3x + 4y = 7 and x - y + 2 = 0 and whose slope is 5.

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33. Find the equation of the line through the intersection of lines x + 2y = 0 and 4xy + 7 = 0 and which is parallel to 5x + 4y = 0

34. Find the equation of the line through the intersection of the lines 3x+y-9=0 and 4x+3y-7=0 and which is perpendicular to the line 5x-4y+1=0.



35. Find the equation of line parallel to the y-axis and drawn through the

point of intersection of x 7y + 5 = 0 and 3x + y 7 = 0.

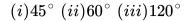
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36. Find the equation of the line through the intersection of the lines $2x + \langle 3y \rangle \langle 4 \rangle = \langle 0$ and $x \langle 5y = \langle 7$ that has its x-intercept equal to $\langle 4$.

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Example

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



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2. What is the inclination of a line whose slope is

A. zero

B. positive

C. negative?

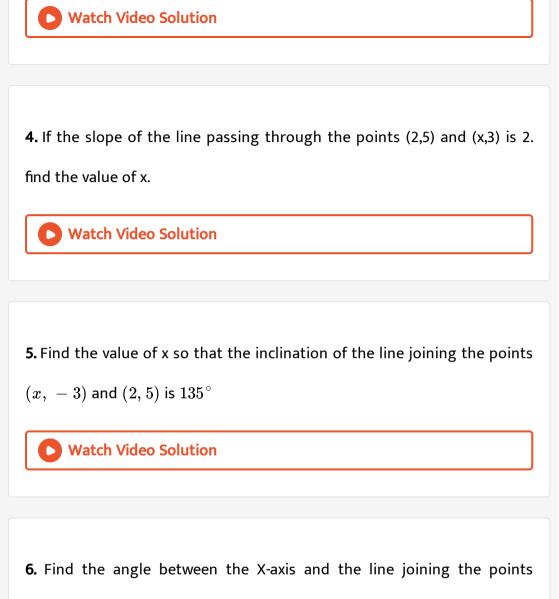
D. not defined?

Answer: D



3. Find the slope of the line passing through the points

(i)(-2,3) and (8, -5) (ii)(4, -3) and (6, -3) (ii)(3, -1) and



$$(3, \ -1) and \ (4, \ -2) \cdot$$

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

(7,-1) and (0,3).



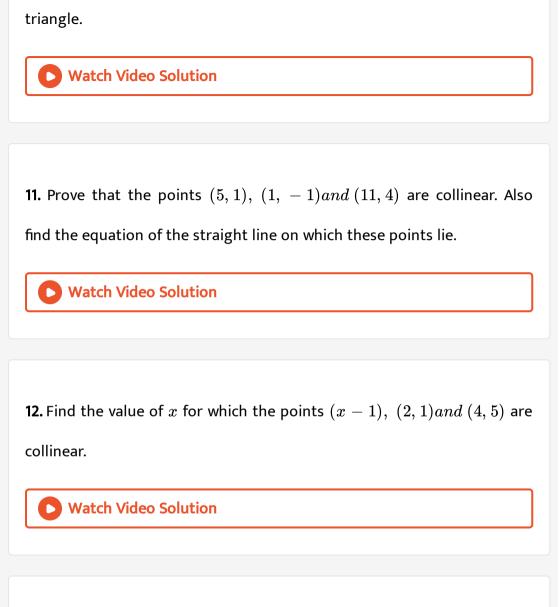
8. Show that the joining (2,-5) and (-2, 5) is perpendicular to the line joining (6,3) and (1,1).

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9. 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.



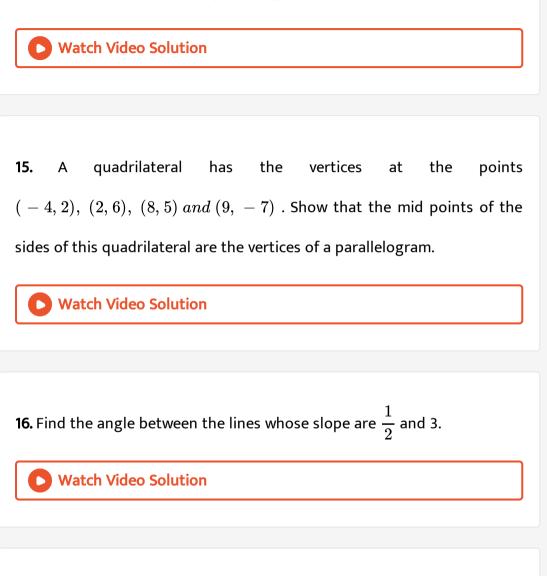
10. Without using Pythagoras theorem, show that A(4, 4), B(3, 5) and C(-1, -1) are the vertices of a right angled



13. If
$$(h,0), (a,b)$$
 and $(0,k)$ lie on a line, show that $\displaystyle rac{a}{h} + \displaystyle rac{b}{k} = 1$

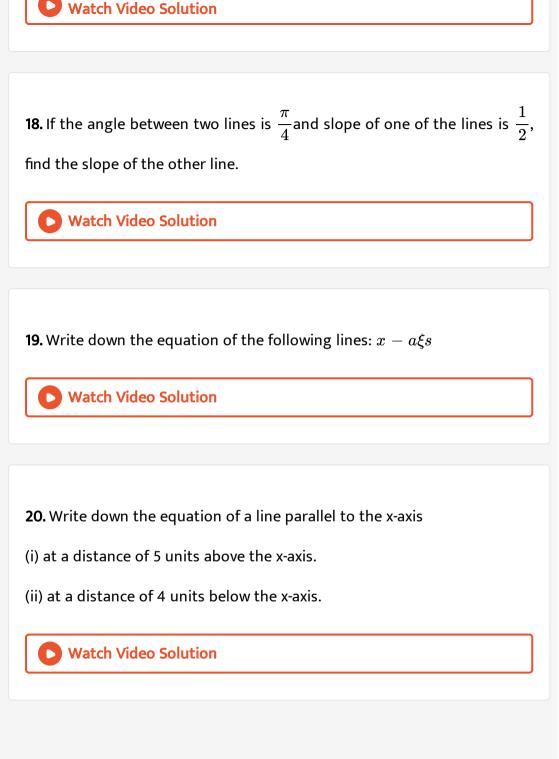
14. By using the concept of slope, show that the points (-2,-10, (4,0), (3,3)

and (-3,2) are the vertices f a parallelogram.



17. If A(-2,1),B(2,3) and C(-2,-4) be the vertices of a riangle ABC, show that $an B = rac{2}{3}$





21. Write down the equation of a line parallel to the y-axis (i) at a distance of 7 units on left-hand side of the y=-axis (ii) at a distance of 3 on right-hand side of the y-axis.

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22. Find the equations of a line parallel to the axes and passing through the point (-3,5).

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23. Find the values of k for which the line $(k-3)x - \left(4-k^2
ight)$

 $y+k^2-7k+6=0$ is (a) Parallel to the xaxis, (b) Parallel to the vaxis, (c)

Passing through the origin.



24. Find the equations of aline which is equidistant from the liines x=-3

and x=5.

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25. Find the equation of a line passing through the point (4,-3) and having slope 2.

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26. Find the equation of a line which makes an angle of 135° with the x-

axis and passes through the point (3,5).



27. Find the equation of a line passsing through the point (3,-4) and parallel to the x-axis.



28. Find the equation of a line passing through the points (-1,1) and (2,-4)

A.
$$5x - 3y - 2 = 0$$

B. 5x - 3y + 2 = 0

C.5x + 3y + 2 = 0

D. 5x + 6y + 2 = 0

Answer: C

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29. Show that the three points (3,0),(-2,-2) and (8,2) are collinear. Also, find

the equation of the straight line on which these points lie.

30. Show that the points (a,0),(0,b) and (3a,-2b) are collinear. Also, find the

equation of line containing them.



31. find the equations of the sides of the triangle whose vertices are (-1, 8), (4, 2) and (-5, -3). Also find the equation the median through (-1, -8)

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32. Find the equation of the medians of the triangle ABC whose vertices

are A(2,5)B(-4,9) and C(-2, -1).

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

A. x - 2y - 6 = 0

$$\mathsf{B}.\,3x - 2y - 6 = 0$$

C. x + 2y + 6 = 0

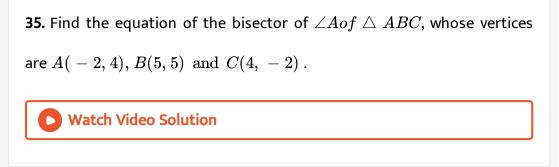
D. x + 2y - 6 = 0

Answer: A

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34. A(2,3) , B(-2,1) and C(4,-3) are the vertices of ΔABC . Find the slope of (i) side AB (ii) altitude through A (iii) median through A (iv) perpendicular bisector of AB.



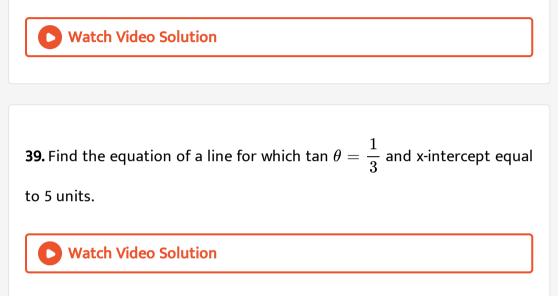


36. Find the equation of a line whose slope is $\frac{1}{2}$ and y-intercept equal to $\frac{-5}{4}$ Watch Video Solution

37. Find the equation of the line which intersects the y-axis at a distance of 2 units above the origin and makes an angle of 30^0 with the positive direction of the x-axis.



38. 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.



40. 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.



41. Reduce the equation 6x + 3y - 5 = 0 to the slope-intercept form

and find its slope and y-intercept.



42. Prove that the line x + 2y - 9 = 0 and 2x + 4y + 5 = 0 are parallel.

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43. Show that the line 27x - 18y + 25 = 0 and 2x + 3y + 7 = 0 are

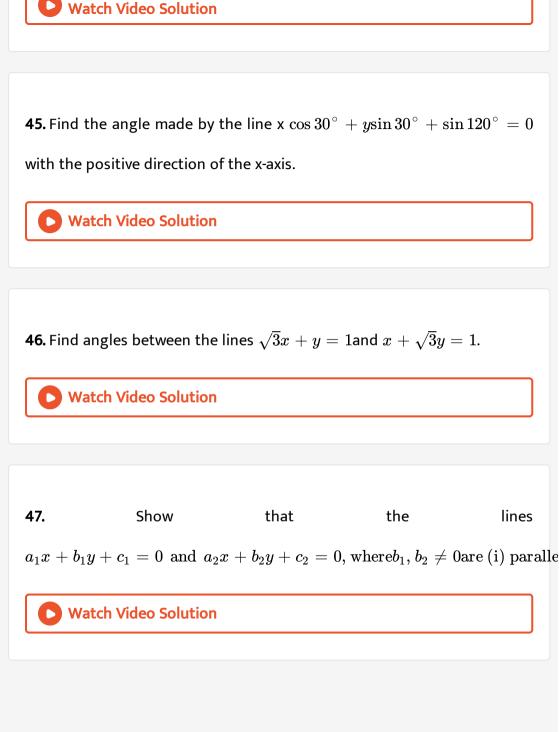
perpendicular to each other.

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44. Find the angle made by the line $x + \sqrt{3}y - 6 = 0$ with the positive

direction of the x-axis.





48. Find the equation of the line passing through the point (2,-5) and parallel to the line 2x-3y=7.



49. Find the tion of the line passing through the point (-2, -4) and perpendicular to the line 3x - y + 5 = 0

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50. Find the equation of the line y-intercept is -3 and which is perpendicular to the line 3x - 2y + 5 = 0

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



52. 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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53. 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.

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54. Find the equation of the line whose perpendicular distance from the origin is 3 units and the angle between the positive direction of x-axis and the perpendicular is 15° .

55. Find the equation of a line whose perpendicular disatnce from the origin is $\sqrt{8}$ units and the angle between the positive direction of the x-axis and the perpendicular is 135° .



56. Find the equation of a line whose perpendicular distance from the origin is 2 units and the angle between the perpendicular segment and the positive of the x-axis is 240° .

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Solved Example

1. Find the equation of the line, which makes intercepts 3 and 2 on the x and y axes respectively.

A. 3x - 2y - 12 = 0

B. 5x - y - 6 = 0

C.5x - 2y - 6 = 0

D. 2x + 3y - 6 = 0

Answer: D

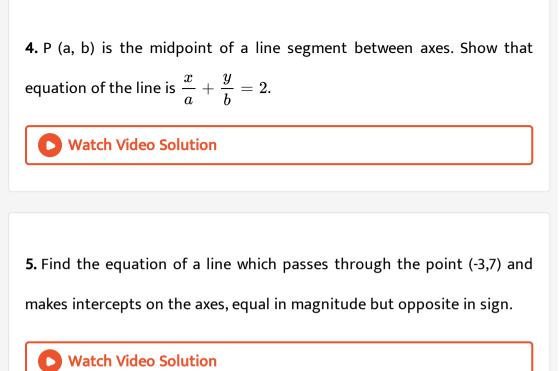
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2. Find the equations of the line which passes through the point (3,4)

and the sum of its intercepts on the axes is14.

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



6. Find the intercepts cut off the line 2x - y + 16 = 0 on the coordintate

axes.

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7. 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.

8. Find the equation of the line so that the segment intercept between the axes is divided by the point P(5,-4) in the ratio 1:2

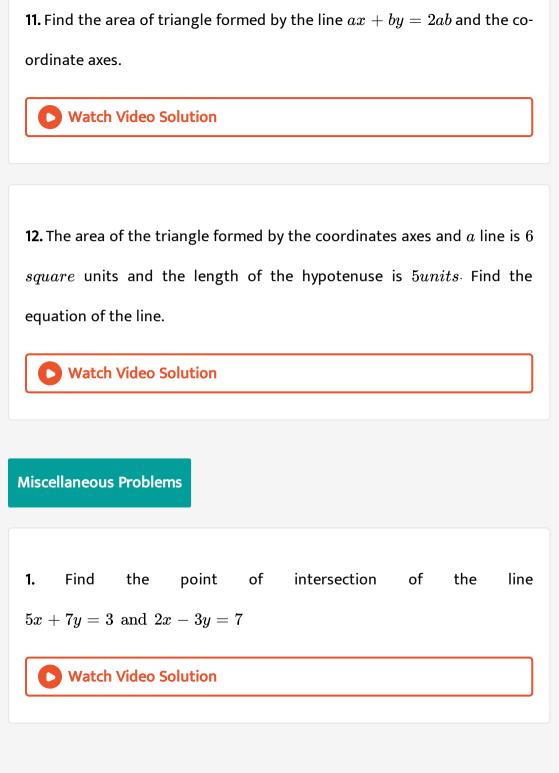


9. Find the equation of a line drawn perpendicular to the line $\frac{x}{4} + \frac{y}{6} = 1$ through the point where it meets the y axis.

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





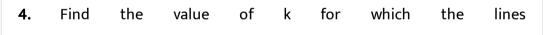
2. Find the equation of the line parallel to the y-axis and drawn through the point of intersection of the lines x - 7y + 15 = 0 and 2x + y = 0.



3. Find the equation of the line passing through the intersection of the

lines x + 2y + 3 = 0 and 3x + 4y + 7 = 0, and parallel to the lie y-x=8

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3x + y = 2, kx + 2y = 3 and 2x - y = 3 may interested at a point.

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5. Show that the lines x-y=6, 4x-4y=20 and 6x+5y+8=0 are concurrent. Also

find the point of intersection.



6. 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

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

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7. Find the area of the triangle formed by the lines y-x=0, x+y=0

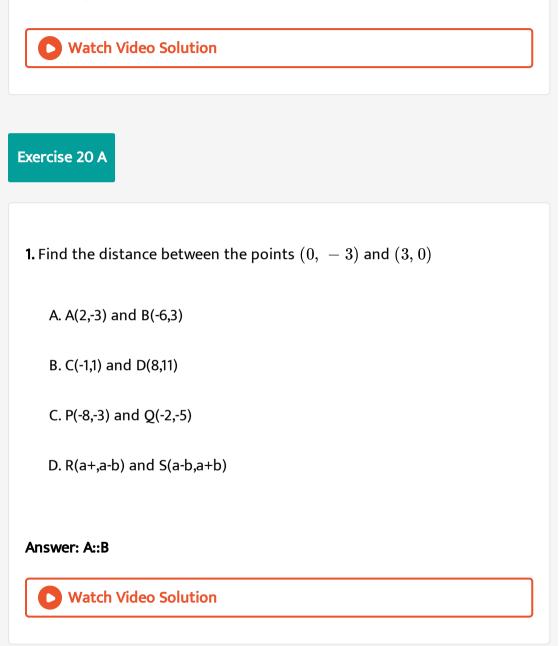
and x - k = 0.

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8. 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 $rac{\left(c_1-c_2
ight)^2}{2|m_1-m_2|}$

9. Find the image of the point (3,8) with respect to the line x+3y=7

assuming the line to be a plane mirror.



2. Find the distance of the point (6, -6) from the origin



3. If a point P(x,y) is equidistant from the points A(6.-1) and

B(2,3) relation between x and y.

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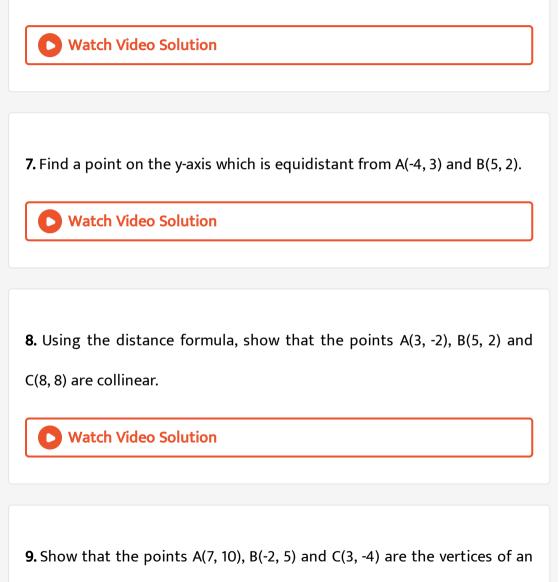
4. Find a point on the x-axis which is equidistant from the points (7, 6)

and (-3, 4) .

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5. 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.

6. A is a point on the x-axis with abscissa -8 and B is a point on the y-axis with ordinate 15. Find the distance AB.



isosceles right-angled triangle.



10. Show that the points A(1, 1), B(-1, -1) and $Cig(-\sqrt{3},\sqrt{3}ig)$ are the

vertices of an equilateral triangle each of whose sides is $2\sqrt{2}$ units.

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11. Show that the points A(2,-2), B(8, 4), C(5,7) and D(-1, 1) are the angular

points of a rectangle.

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12. Show that A(3, 2), B(0, 5), C(-3, 2) and D(0, -1) are the vertices of a

square.

13. Show that the points A(1, -2), B(3, 6), C(5, 10) and D(3, 2)

are the vertices of a parallelogram.



14. Show that the points A(2, -1), B(3, 4), C(-2, 3) and D(-3, -2) are the vertices of a rhombus.

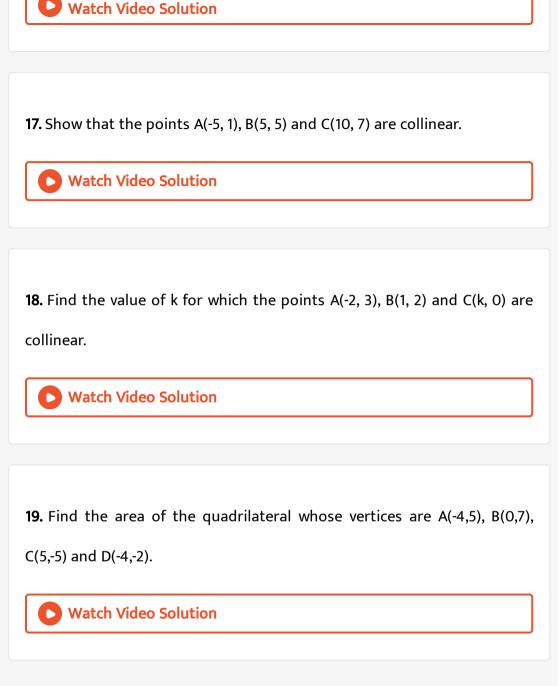
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15. If the points (-2, -1), (1, 0), (x, 3) and (1, y) form a parallelogram, find the values of x and y.

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16. Find the area of $\triangle ABC$ whose vertices are A(-3, -5), B(5,2) and C(-9,-3).





20. Find the area of riangle ABC, the midpoints of whose sides AB, BC and

CA are D(3,-1), E(5, 3) and F(1,-3) respectively.



21. Find the coordinates of the point which divides the join of A(-5,11) and

B(4,-7) in the ratio 2:7.

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22. Find the ratio in which the x-axis cuts the join of the points A(4,5) and

B(-10,-2). Also, find the point of intersection.



23. In what ratio is the line segment joining the points A(-4,2) and B(8,3)

divided by the y-axis? Also, find the point of intersection.



Exercise 20 B

1. Find the angle of inclination of the line whose slope is $(i)\frac{1}{\sqrt{3}}$, $(ii) - \sqrt{3}$.



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

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(i)45^{\,\circ}\,\,(ii)60^{\,\circ}\,\,(iii)120^{\,\circ}
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3. Find the slope of a line which passes through the points

(i)(0,0)and (4,-2) (ii)(0,-3) and (2,1)

(iii)(2,5)and (-4,-4) (iv)(-2,3)and (4,-6)



4. If the slope of the line joining the points A(x,2) and B(6,-8) is find the

value of x.

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5. Show that the line through the points (5, 6) and (2, 3) is parallel to the

line through the points (9,-2) and (6,-5).

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6. 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)?

7. Show that the line through the points (-2, 6) and (4, 8) is perpendicular to the line through the points (3,-3) and (5,-9).



8. If A(2, -5), B(-2, 5), C(x, 3) and D(1, 1) be four points such that AB and CD are perpendicular to each other, find the value of x.

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9. Without using Pythagoras's theorem, show that the points A(1, 2), B(4,

5) and C(6, 3) are the vertices of a right-angled triangle.



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

collinear.



11. Using slopes, find the value of x for which the points A(5, 1), B(1,-1) and

C(x-4) are collinear.

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12. Show that the points (-4, -1), (-2, -4), (4, 0) and (2, 3)

are the vertices points of a rectangle.

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13. Prove that the points (-2, -1), (1, 0), (4, 3), and (1,2) are the

vertices of a parallelogram. Is it a rectangle?

14. Three 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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15. 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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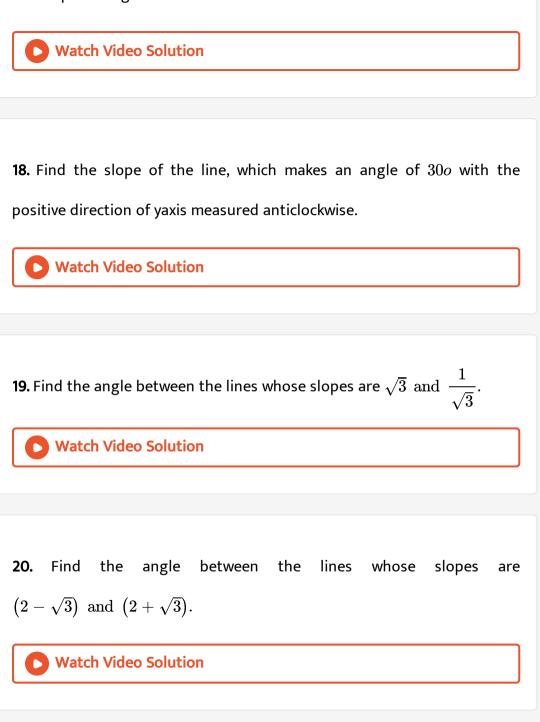
16. A line passes through the points A(4, -6) and B(-2,-5). Show that the

line AB makes an obtuse angle with the x-axis.



17. The vertices of a quadrilateral are A(-4, 2), B(2, 6), C(8, 5) and D(9,-7). Using slopes, show that the midpoints of the sides of the quad. ABCD





21. If A(1, 2), B(-3, 2) and C(3, -2) be the vertices of a A ABC, show that

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

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22. If θ is the angle between the lines joining the points A(0, 0) and B(2, 3),

and the points C(2,-2) and D(3,5), show that $an heta = rac{11}{23}$

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23. If θ is the angle between the diagonals of a parallelogram ABCD whose vertices are A(0, 2), B(2, -1), C(4, 0) and D(2, 3). Show that $\tan \theta = 2$.



24. Show that the points A(0, 6), B(2, 1) and C(7, 3) are three corners of a square ABCD. Find (i) the slope of the diagonal BD and (i) the coordinates of the fourth vertex D.

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25. A(1, 1), B(7, 3) and C(3, 6) are the vertices of a $\triangle ABC$. If D is the

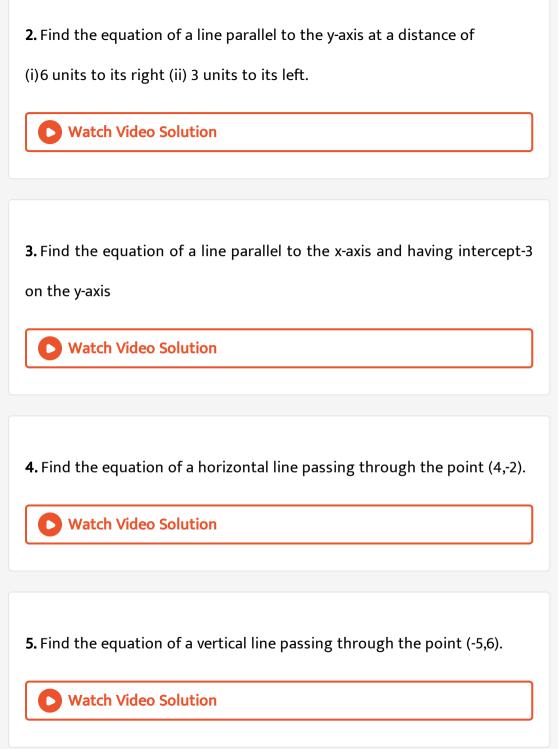
midpoint of BC and AL BC, find the slopes of (i) AD and (ii) AL.

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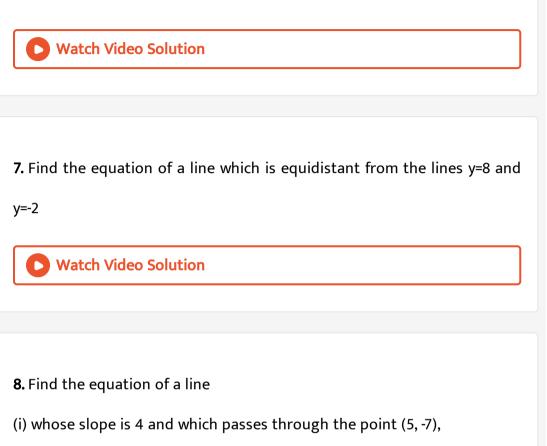
1. Find the equation of a line parallel to the x-axis at a distance of

(i) 4 units above it (ii) 5 units below it.



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

x=6.



(ii) whose slope is -3 and which passes through the point (-2, 3),

(iii) which makes an angle of $\left(\frac{2\pi}{3}\right)$ with the positive direction of the x-axis and passes through the point (0, 2).

9. Find the equation of a line whose inclination with the x-axis is 30° and which passes through the point (0, 5).

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10. Find the equation of a line whose inclination with the x-axis is 150° and which passes through the point (3, -5).

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11. Find the equation of a line passing through the origin and making an

angle of 120° with the positive direction of the x-axis.



12. Find the equation of a line which cuts off intercept 5 on the x-axis and

makes an angle of $60\,^\circ$ with the positive direction of the x-axis.



13. Find the equation of the line passing through the point P(4, -5) and parallel to the line joining the points A(3, 7) and B(-2, 4).

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14. Find the equation of the line passing through the point P(-3,5) and perpendicular to the line passing through the points A(2, 5) and B(-3, 6).

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15. Find the slope and the equation of the line passing through the points:

(i)(3,-2) and (-5,-7) (ii)(-1,1) and (2,-4)

(5,3) and (-5,-3) (iv) (a,b) and (-a,b)



16. Find the angle which the line joining the points $(1, \sqrt{3})$ and $(\sqrt{2}, \sqrt{6})$ makes with the x-axis.



17. Prove that the points A(1, 4), B(3, -2) and C(4, -5) are collinear. Also find

the equation of the line on which these points lie.

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18. If A(0, 0), B(2, 4) and C(6, 4) are the vertices of a $\triangle ABC$, find the equations of its sides.

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19. If A(-1, 6), B(-3, -9) and C(5, -8) are the vertices of a riangle ABC, find the

equations of its medians.



20. Find the equation of the perpendicular bisector of the line segment

whose end points are A(10, 4) and B(-4,9)

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21. Find the equations of the altitudes of a $\ riangle ABC$, whose vertices are

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

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22. If A(4, 3), B(0, 0) and C(2, 3) are the vertices of a $\ riangle ABC$, find the

equation of the bisector of $\angle A$.

23. The midpoints of the sides BC, CA and AB of a $\ \triangle ABC$ are D(2,1), E(-5,7)and F-5, -5) respectively. Find the equations of the sides of $\ \triangle ABC$



24. If A(1, 4), B(2, 3) and C(-1,-2) are the vertices of a $\triangle ABC$, find the

equation of

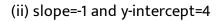
- (i) the median through A
- (ii) the altitude through A
- (iii) the perpendicular bisector of BC.

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1. Find the equation of the line whose

(i) slope=3 and y-intercept=5

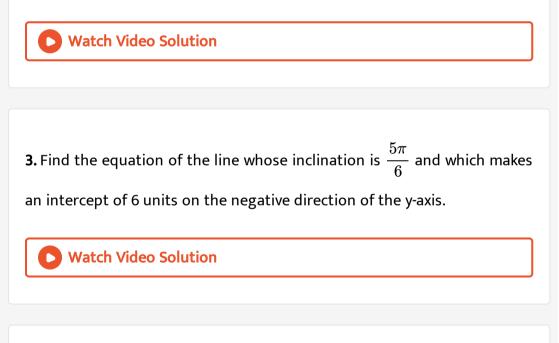


(iii) slope =
$$-\frac{2}{5}$$
 and y-intercept=-3

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2. Find eqn of line which cut off an intercept of 4 units on the x- axis and

makes an angle of $30\,^\circ$ with positive direction of y- axis.



4. Find the equation of the line cutting off an intercept-2 from the y-axis and equally inclined to the axes.

5. Find the equation of the bisectors of the angles between the coordinate axes.

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6. Find the equation of the line through the point (-1,5) and making an intercept of -2 on the y-axis.

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7. Find the equation of the line which is parallel to the line 2x-3y=8 and whose y-intercpt is 5 units.



8. Find	the	equation	of the	line	passing	through	the	point	(0, 3) and
perpen	dicul	ar to the l	ine x-2y	+5=0						

9. Find the equation of the line passing through the point (2, 3) and perpendicular to the line 4x+3y=10.

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10. Find the equation of the line passing through the point (2, 4) and perpendicular to the x-axis.



11. Find the equation of the line that has x-intercept-3 and which is perpendicular to the line 3x+5y=4



12. Find the equation of the line which is perpendicular to the line 3x+2y=8 (4,-2) and passes through the midpoint of the line joining the points (6,4) and (4,-2)

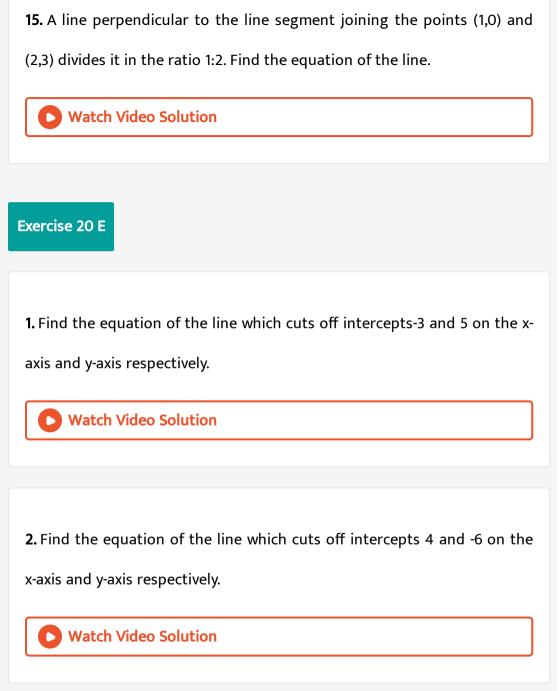
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13. Find the equation of the line whose y-intercept is -3 and which is perpendicular to the line joining the points (-2,3) and (4,-5).

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14. Find the equation of the line passing through (-3, 5) and perpendicular

to the line through the points (2, 5) and (-3,6).



3. Find the equation of the line that cuts off equal intercepts on the coordinate axes and passes through the point (4,7).

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4. Find the equation of the line which passes through the point (3, -5) and cuts off intercepts on the axes which are equal in magnitude but opposite in sign.

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

off intercepts on the axes whose sum is 9.



6. Find the equation of the line which passes through the point (22,-6) and whose intercept on the x-axis exceeds the intercept on the y-axis by 5.

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7. Find the equation of the line whose portion intercepted between the axes is bisected at the point (3,-2)

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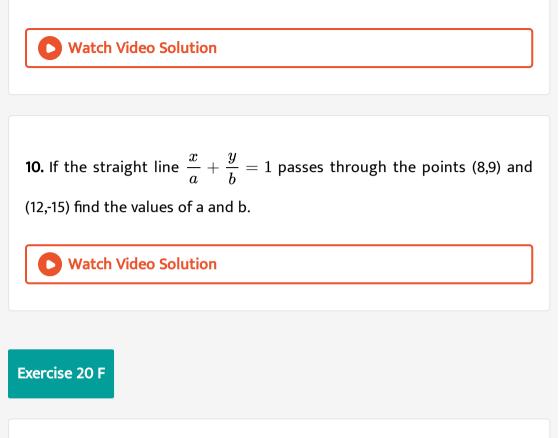
8. Find the equation of the line whose portion intercepted between the

coordinate axes is divided at the point (5, 6) in the ratio 3:1.



9. A straight line passes through the point (-5,2) and the portion of the line intercepted between the axes is divided at this point in the ratio 2:3.

Find the equation of the line.



1. Find the equation of the line for which

$$(i)p=3 ext{ and } lpha=45^{\circ} ext{ (ii)}p=5 ext{ and } lpha=135^{\circ}$$

(iii) $p=8lpha=150^\circ$ (iv) p=3 and $lpha=225^\circ$

(v)p=2 and $lpha=300^\circ$ (vi)p=4 and $lpha=180^\circ$

2. The length of the perpendicular segment from the origin to a line is 2 units and the inclination of this perpendicular is α such that sin $\alpha = \frac{1}{3}$ and α is acute. Find the equation of the line.

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3. Find the equation of the line which is at a distance of 3 units from the origin such that $\tan \alpha = \frac{5}{12}$, where α is the acute angle which this perpendicular makes with the positive direction of the x-axis.

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Exercise 20 G

1. Reduce the equation 2x-3y-5=0 to slope-intercept form, and find from it

the slope and y-intercept

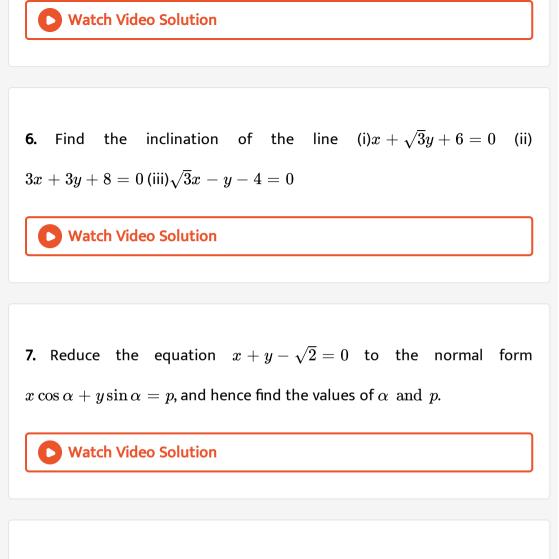
2. Reduce the equation 5x+7y-35=0 to slope-intercept form, and hence

find the slope and the y-intercept of the line

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3. Reduce the equation y+5=0 to slope-intercept form, and hence find the slope and the y-intercept of the line.
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4. Reduce the equation 3x-4y+12=0 to intercepts form. Hence, find the length of the portion of the line intercepted between the axes.
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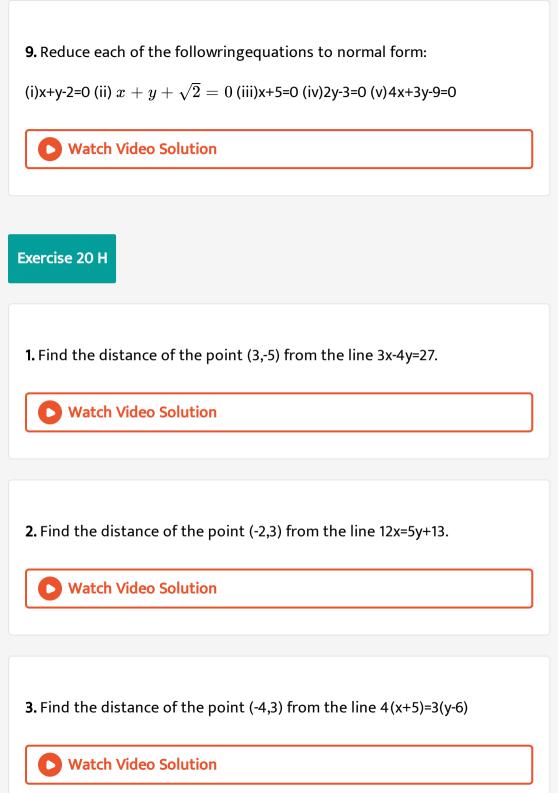
5. Reduce the equation 5x-12y=60 to intercepts form. Hence, find the

length of the portion of the line intercepted between the axes.



8. Reduce the equation $x+\sqrt{3}y-4=0$ to the normal form

 $x\coslpha+y\sinlpha=p$, and hence find the values of lpha~ and ~p.



4. Find the distance of the point (2, 3) from the line y=4.

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5. Find the distance of the point (4, 2) from the line joining the points (4,

1) and (2,3).

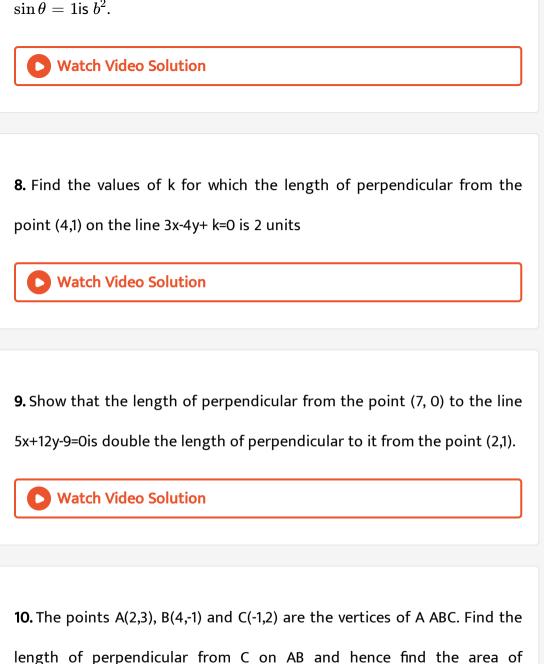
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6. Find the length of perpendicular from the origin to each of the following (i)7x+24y=50 (ii)4x+3y=9 (iii)x=4



7. Prove that the product of the lengths of the perpendiculars drawn from the points $(\sqrt{a^2 - b^2}, 0)$ and $(-\sqrt{a^2 - b^2}, 0)$ to the line $\frac{x}{a}\cos\theta + \frac{y}{b}$

 $\sin\theta = 1$ is b^2 .



 \wedge ABC.

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

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

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13. A vertex of a square is at the origin and its one side lies along the line

3x-4y-10=0. Find the area of the square.



14. Find the distance between the parallel lines 4x-3y+5=0 and 4x-3y=0



15. Pind the distance between the parallel lines 8x+15y-36=0 and 8x+15y+32=0.

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16. Find the distance between the parallel lines y=mx+c and y=mx+d.

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17. Find the distance between the parallel lines p(x+y)+g=0 and p(x+y)-r=0.



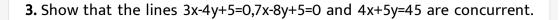
18. Prove that the line 12x-5y-3=0 is mid-parallel to the lines 12x-5y+7=0and

12x-5y-13=0

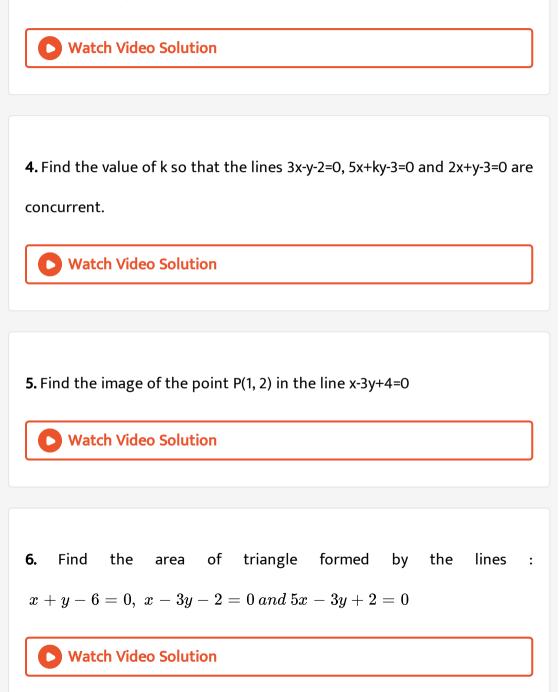
19. The perpendicular distance of a line from the origin is 5 units and its

slope is -1. Find the equation of the line.

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Exercise 20 I
1. Find the points of interesting of the lines `4x+3y=5 and x=2y-7 Watch Video Solution
2. Show that the lines x+7y=23 and 5x+2y=16 interest at the point (2,3)
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Also find their point of intersection.



7. Find the area of the triangle formed by the lines x=0, y=1 and 2x+y=2.

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8. Find the area of the triangle, the equations of whose sides are y=x, y=2x

and y-3x=4.

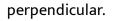
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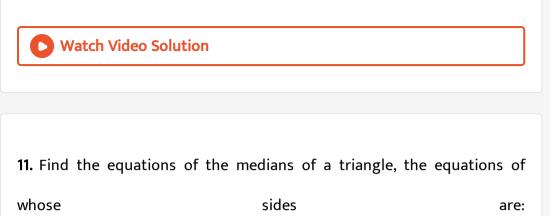
9. Find the equation of the perpendicular drawn from the origin to the

line 4x-3y+5=0. Also, find the coordinates of the foot of the perpendicular.

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10. Find the equation of the perpendicular drawn from the point P(-2,3) to the line x-4y+7=0. Also, find the coordinates of the foot of the





 $3x + 2y + 6 = 0, \ 2x - 5y + 4 = 0 \ and \ x - 3y - 6 = 0$

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Exercise 20 J

1. If the origin is shifted to the point (1, 2) by a translation of the axes, find

the new coordinates of the point (3,-4)

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2. If the origin is shifted to the point (-3,-2) by a translation of the axes, find the new coordinates of the point (3,-5).

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3. If the origin is shifted to the point (0,-2) by a translation of the axes, the coordinates of a point become (3, 2). Find the original coordinates of the point.

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4. If the origin is shifted to the point (2,-1) by a translation of the axes, the

coordinates of a point become (-3,5). Find the original coordinates of the

point.

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5. At what point must the origin be shifted, if the coordinates of a point

(4, 2) become (3,-2)?



6. The equation $x^2 + xy - 3x - y + 2 = 0$ become when the origin is shifted to the point (1, 1) is

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7. Find what the following equation become when the origin is shifted to

the point (1,1): $xy - y^2 - x + y = 0$

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8. Find what the following equation become when the origin is shifted to the point (1,1): $x^2 - y^2 - 2x + 2y = 0$

9. Find what the following equation become when the origin is shifted to

the point (1,1): xy - x - y + 1 = 0

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10. Transform the equation $2x^2 + y^2 - 4x + 4y = 0$ to parallel axes when the origin is shifted to the point (1,-2)

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Exercise 20 K

1. Find the equation of the line drawn through the point of intersection of the lines x - 2y + 3 = 0 and 2x - 3y + 4 = 0 and passing through the point (4,-5).

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2. Find the equation of the line drawn through the point of intersection

of the lines x - y = 7 and 2x + y = 2 and passing through the origin.

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3. Find the equation of the line drawn through the point of intersection of the lines x+y=9 and 2x-3y+7=0 and whose slope is $\frac{-2}{3}$
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4. Find the equation of the line drawn through the point of intersection of the lines x-y=1 and 2x-3y+1=0 and which is parallel to the line 3x+4y=12

5. Find the equation of the line through the intersection of the lines 5x-3y=1 and 2x+3y=23 and which is perpendicular to the line 5x-3y=1

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6. Find the equation of the line through the intersection of the lines 2x-

3y=0 and 4x-5y=2 and which is perpendicular to the line x+2y+1=0.

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7. Find the equation of the line through the intersection of the lines x-

7y+5=0 and 3x+y-7=0 and which is parallel to x-axis.



8. Find the equation of the line through the intersection of the lines 2x-

3y+1=0 and x+y-2=0 and drawn parallel to y-axis.



9. Find the equation of the line through the intersection of the lines

2x+3y-2=0 and x-2y+1=0 and having x-intercept equal to 3.

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10. Find the equation of the line passing through the intersection of the

lines 3x-4y+1=0 and 5x+y-1=0 and which cuts off equal intercepts from the

axes.

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