# MATHS

# NCERT - FULL MARKS

# MATHEMATICS(TAMIL)

# TWO DIMENSIONAL ANALYTICAL GEOMETRY

Example

**1.** Find the path traced out by the point $\left(ct, \frac{c}{t}\right)$ , here $t \neq 0$ the parameter and c is aconstat

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**2.** If $\theta$ is a parameter,find the equation of the locus of a moving point ,whose coordinates are $(a \sec \theta, b \tan \theta)$

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**3.** A straight rod of the length 6 units, slides with its ends A and B always on the x and y axes respectively. If O is the origin, then find the locus of the centroid of $\Delta OAB$

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**4.** Show that points $\left(0, -\frac{3}{2}\right), (1, -1)$ and $\left(2, -\frac{1}{2}\right)$ are collinear.

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**5.** The Pamban Sea Bridge is a railway bridge of length about 2065 m constructed on the PalkStrait, which connects the Island town of Rameswaram to Mandapam, the main land of India. The Bridge is restricted to a uniform speed of only 12.5 m/s. If a train of length 560 m starts at the entry point of the bridge from Mandapam, then

find an equation of the motion of the train.

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**6.** The Pamban Sea Bridge is a railway bridge of length about 2065 m constructed on the PalkStrait, which connects the Island town of Rameswaram to Mandapam, the main land of India. The Bridge is restricted to a uniform speed of only 12.5 m/s. If a train of length 560 m starts at the entry point of the bridge from Mandapam, then

when does the engine touch island

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**7.** The Pamban Sea Bridge is a railway bridge of length about 2065 m constructed on the PalkStrait, which connects the Island town of Rameswaram to Mandapam, the main land of India. The Bridge is restricted to a uniform speed of only 12.5 m/s. If a train of length 560 m starts at the entry point of the bridge from Mandapam, then

when does the last coach cross the entry point of the bridge

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**8.** The Pamban Sea Bridge is a railway bridge of length about 2065 m constructed on the PalkStrait, which connects the Island town of Rameswaram to Mandapam, the main land of India. The Bridge is restricted to a uniform speed of only 12.5 m/s. If a train of length 560 m starts at the entry point of the bridge from Mandapam, then

what is the time taken by a train to cross the bridge.

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**9.** Find the equations of the straight lines, making the y- intercept of 7 and angle between the line and the y-axis is $30^\circ$

View Text Solution

**10.** The seventh term of an arithmetic progression is 30 and tenth term is 21.

Find the first three terms of an A.P.

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**11.** The seventh term of an arithmetic progression is 30 and tenth term is 21.

Which term of the A.P. is zero (if exists)

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**12.** The quantity demanded of a certain type of Compact Disk is 22,000 units when a unit price is Rs 8. The customer will not buy the disk, at a unit price of Rs 30 or higher. On the other side the manufacturer will not market any disk if the price is Rs 6 or lower. However, if the price

Rs 14 the manufacturer can supply 24,000 units. Assume that the quantity demanded and quantity supplied are linearly proportional to the price. Find ) the demand equation

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**13.** The quantity demanded of a certain type of Compact Disk is 22,000 units when a unit price is Rs 8. The customer will not buy the disk, at a unit price of Rs 30 or higher. On the other side

the manufacturer will not market any disk if the price is Rs 6 or lower. However, if the price Rs 14 the manufacturer can supply 24,000 units. Assume that the quantity demanded and quantity supplied are linearly proportional to the price. Find supply equation.

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**14.** The quantity demanded of a certain type of Compact Disk is 22,000 units when a unit price

is Rs 8. The customer will not buy the disk, at a unit price of Rs 30 or higher. On the other side the manufacturer will not market any disk if the price is Rs 6 or lower. However, if the price Rs 14 the manufacturer can supply 24,000 units. Assume that the quantity demanded and quantity supplied are linearly proportional to the price. Find the market equilibrium quantity and price.

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**15.** The quantity demanded of a certain type of Compact Disk is 22,000 units when a unit price is Rs 8. The customer will not buy the disk, at a unit price of Rs 30 or higher. On the other side the manufacturer will not market any disk if the price is Rs 6 or lower. However, if the price Rs 14 the manufacturer can supply 24,000 units. Assume that the quantity demanded and quantity supplied are linearly proportional to the price. Find The quantity of demand and supply when the price is Rs 10

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**16.** Find the equation of the straight line passing through (– 1, 1) and cutting off equal intercepts, but opposite in signs with the two coordinate axes.

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**17.** A straight line L with negative slope passes through the point (9, 4) cuts the positive coordinate axes at the points P and Q. As L

varies, find the minimum value of $|OP| + |OQ|$, where O is the origin.

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**18.** Area of the triangle formed by a line with the coordinate axes, is 36 square units. Find the equation of the line if the perpendicular drawn from the origin to the line makes an angle of $45^\circ$ with positive the x-axis.

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**19.** Express the equation $\sqrt{3}x - y + 4 = 0$ in the following equivalent form:

Slope and Intercept form

View Text Solution

**20.** Express the equation $\sqrt{3}x - y + 4 = 0$ in the following equivalent form:

Intercept form

View Text Solution

**21.** Express the equation $\sqrt{3}x - y + 4 = 0$ in the following equivalent form:

Normal form

View Text Solution

**22.** Rewrite $\sqrt{3}x + y + 4 = 0$ in to normal form

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**23.** Find the equations of a parallel line and a perpendicular line passing through the point (1, 2) to the line $3x+ 4y = 7$.

View Text Solution

**24.** Find the distance between two points (5, 4) and (2, 0)

View Text Solution

**25.** Find the distance

from a point (1, 2) to the line $5x + 12y - 3=0$

View Text Solution

**26.** Find the distance

between two parallel lines $3x + 4y = 12$ and $6x + 8y + 1=0$.

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**27.** A car rental firm has charges Rs 25 with 1.8 free kilometers, and Rs 12 for every additional kilometer. Find the equation relating the cost y to the number of kilometers x. Also find the cost to travel 15 kilometers

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**28.** Show that the straight lines $x^2 - 4xy + y^2 = 0$ and $x + y = 3$ form an equilateral triangle.

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**29.** If the pair of lines represented by $x^2 - 2cxy - y^2 = 0$ and $x^2 - 2dxy - y^2 = 0$ be such that each pair bisects the angle between the other pair, prove that cd = −1.

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**30.** If the equation $\lambda x^2 - 10xy + 12y^2 + 5x - 16y - 3 = 0$

represents a pair of straight lines, find angle between the lines

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**31.** A student when walks from his house, at an average speed of 6 kmph, reaches his school ten minutes before the school starts. When his average speed is 4 kmph, he reaches his school five minutes late. If he starts to school every day at 8.00 A.M, then find the distance between his house and the school

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**32.** A student when walks from his house, at an average speed of 6 kmph, reaches his school ten minutes before the school starts. When his average speed is 4 kmph, he reaches his school five minutes late. If he starts to school every day at 8.00 A.M, then find the minimum average speed to reach the school on time and time taken to reach the school the time the school gate closes

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**33.** A student when walks from his house, at an average speed of 6 kmph, reaches his school ten minutes before the school starts. When his average speed is 4 kmph, he reaches his school five minutes late. If he starts to school every day at 8.00 A.M, then find the time the school gate closes

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Exercise 6 1

**1.** Find the locus of P, if for all values of α, the co-ordinates of a moving point P is $(9\cos\alpha, 9\sin\alpha)$

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**2.** Find the locus of P, if for all values of α, the co-ordinates of a moving point P is $9\cos\alpha, 6\sin\alpha)$

View Text Solution

**3.** Find the locus of a point P that moves at a constant distant of two units from the x-axis

View Text Solution

**4.** Find the locus of a point P that moves at a constant distant of three units from the y-axis.

View Text Solution

**5.** If $\theta$ is a parameter, find the equation of the locus of a moving point, whose coordinates are x=a cos^(3) theta,y= a sin^(3) theta`.

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**6.** Find the value of k and b, if the points P(−3, 1) and Q(2,b) lie on the locus of $x^2 - 5x + ky = 0.$

View Text Solution

**7.** A straight rod of length 8 units slides with its ends A and B always on the x and y axes respectively. Find the locus of the mid point of the line segment AB

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**8.** Find the equation of the locus of a point such that the sum of the squares of the distance from the points (3, 5), (1, −1) is equal to 20

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**9.** Find the equation of the locus of the point P such that the line segment AB, joining the points A(1, −6) and B(4, −2), subtends a right angle at P

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**10.** If O is origin and R is a variable point on $y^2 = 4x$, then find the equation of the locus of the mid-point of the line segment OR.

View Text Solution

**11.** If P(2, −7) is a given point and Q is a point on $2x^2 + 9y^2 = 18$ then find the equations of the locus of the mid-point of P Q.

View Text Solution

**12.** If R is any point on the x-axis and Q is any point on the y-axis and P is a variable point on RQ with RP = b, PQ = a. then find the equation of locus of P

View Text Solution

**13.** . If the points P(6, 2) and Q(−2, 1) and R are the vertices of a $\Delta PQR$ and R is the point on the locus $y = x^2 - 3x + 4$ , then find the equation of the locus of centroid of $\Delta PQR$

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**14.** . If Q is a point on the locus of $x^2 + y^2 + 4x - 3y + 7 = 0,$ then find the

equation of locus of P which divides segment OQ externally in the ratio 3:4,where O is origin.

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**15.** Find the points on the locus of points that are 3 units from x-axis and 5 units from the point (5, 1).

View Text Solution

**16.** The sum of the distance of a moving point from the points (4, 0) and (−4, 0) is always 10 units. Find the equation of the locus of the moving point.

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## Exercise 6 2

**1.** Find the equation of the lines passing through the point (1,1)

with y-intercept (−4)

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**2.** Find the equation of the lines passing through the point (1,1)

with slope 3

View Text Solution

**3.** Find the equation of the lines passing through the point (1,1)

and (-2,3)

View Text Solution

**4.** Find the equation of the lines passing through the point (1,1)

and the perpendicular from the origin makes an angle $60^\circ$ with x- axis.

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**5.** Find the equation of the line passing through the point (1, 5) and also divides the co-ordinate axes in the ratio 3:10.

View Text Solution

**6.** The normal boiling point of water is $100^\circ C$ or $212^\circ F$ and the freezing point of water is $0^\circ C$ or $32^\circ F$

Find the linear relationship between C and F

Find

View Text Solution

**7.** The normal boiling point of water is $100^\circ C$ or $212^\circ F$ and the freezing point of water is $0^\circ C$ or $32^\circ F$

the value of C for $98.6^\circ F$ and

View Text Solution

**8.** The normal boiling point of water is $100^\circ C$ or $212^\circ F$ and the freezing point of water is

$0^\circ C$ or $32^\circ F$

the value of F for $38^\circ C$

View Text Solution

**9.** An object was launched from a place P in constant speed to hit a target. At the 15th second it was 1400 m away from the target and at the 18th second 800m away. Find the distance between the place and the target

View Text Solution

**10.** An object was launched from a place P in constant speed to hit a target. At the 15th second it was 1400 m away from the target and at the 18th second 800m away. Find the distance covered by it in 15 seconds.

View Text Solution

**11.** An object was launched from a place P in constant speed to hit a target. At the 15th second it was 1400 m away from the target

and at the 18th second 800m away. Find time taken to hit the target.

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**12.** Population of a city in the years 2005 and 2010 are 1,35,000 and 1,45,000 respectively. Find the approximate population in the year 2015. (assuming that the growth of population is constant)

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**13.** Find the equation of the line, if the perpendicular drawn from the origin makes an angle $30^\circ$ with x-axis and its length is 12.

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**14.** Find the equation of the straight lines passing through (8, 3) and having intercepts whose sum is 1

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**15.** A straight line is passing through the point A(1, 2) with slope $\frac{5}{12}$ Find points on the line which are 13 units away from A.

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**16.** A 150 m long train is moving with constant velocity of 12.5 m/s. Find the equation of the motion of the train,

View Text Solution

**17.** A 150 m long train is moving with constant velocity of 12.5 m/s. Find time taken to cross a pole.

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**18.** A 150 m long train is moving with constant velocity of 12.5 m/s. Find The time taken to cross the bridge of length 850 m is?

View Text Solution

**19.** A spring was hung from a hook in the ceiling. A number of different weights were attached to the spring to make it stretch, and the total length of the spring was measured each time shown in the following table.

| Weight, (kg) | 2 | 4 | 5 | 8 |
|---|---|---|---|---|
| Length, (cm) | 3 | 4 | 4.5 | 6 |

Find the equation relating the length of the spring to the weight on it.

View Text Solution

**20.** A spring was hung from a hook in the ceiling. A number of different weights were attached to the spring to make it stretch, and the total length of the spring was measured each time shown in the following table.

| Weight, (kg) | 2 | 4 | 5 | 8 |
|---|---|---|---|---|
| Length, (cm) | 3 | 4 | 4.5 | 6 |

What is the actual length of the spring.

View Text Solution

**21.** A spring was hung from a hook in the ceiling. A number of different weights were attached to the spring to make it stretch, and the total length of the spring was measured each time shown in the following table.

| Weight, (kg) | 2 | 4 | 5 | 8 |
|---|---|---|---|---|
| Length, (cm) | 3 | 4 | 4.5 | 6 |

If the spring has to stretch to 9 cm long, how much weight should be added?

View Text Solution

**22.** A spring was hung from a hook in the ceiling. A number of different weights were attached to the spring to make it stretch, and the total length of the spring was measured each time shown in the following table.

| Weight, (kg) | 2 | 4 | 5 | 8 |
|---|---|---|---|---|
| Length, (cm) | 3 | 4 | 4.5 | 6 |

How long will the spring be when 6 kilograms of weight on it?

View Text Solution

**23.** A family is using Liquefied petroleum gas (LPG) of weight 14.2 kg for consumption. (Full weight 29.5kg includes the empty cylinders tare weight of 15.3kg.). If it is use with constant rate then it lasts for 24 days. Then the new cylinder is replaced Find the equation relating the quantity of gas in the cylinder to the days.

View Text Solution

**24.** A family is using Liquefied petroleum gas (LPG) of weight 14.2 kg for consumption. (Full

weight 29.5kg includes the empty cylinders tare weight of 15.3kg.). If it is use with constant rate then it lasts for 24 days. Then the new cylinder is replaced Draw the graph for first 96 days.

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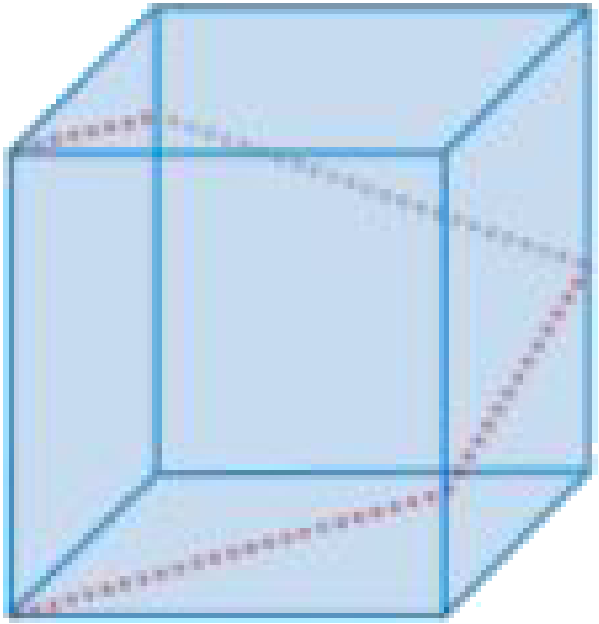
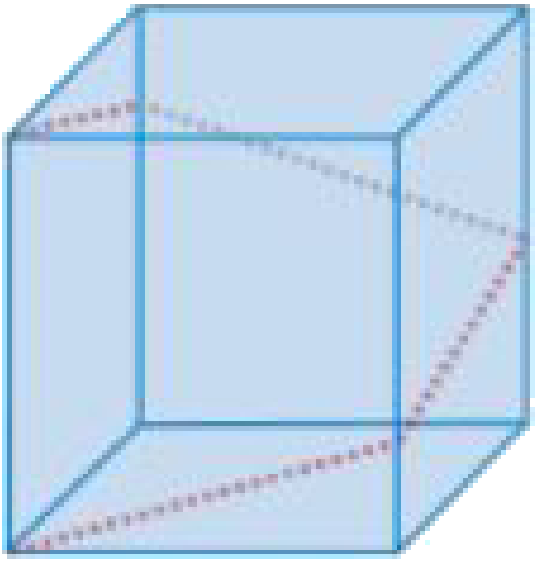
**25.** In a shopping mall there is a hall of cuboid shape with dimension $800x \times 800x \times 720$ units, which needs to be added the facility of an escalator in the path as shown by the

dotted line in the figure. Find the minimum total length of the escalator.



View Text Solution

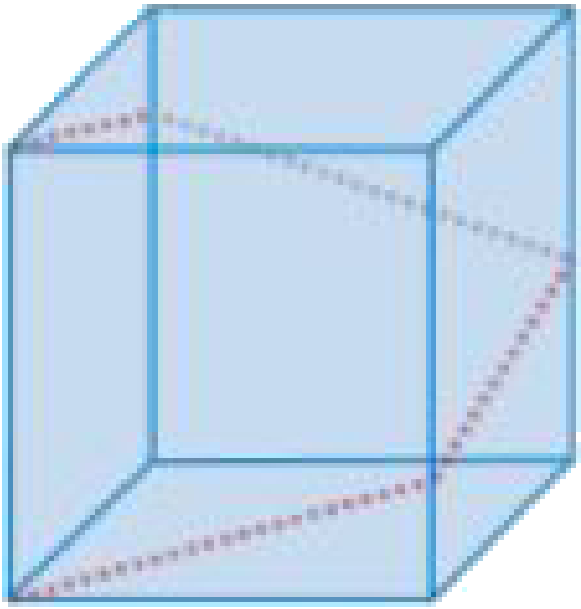
**26.** In a shopping mall there is a hall of cuboid shape with dimension $800x \times 800x \times 720$ units, which needs to be added the facility of an escalator in the path as shown by the dotted line in the figure. Find the heights at which the escalator changes its direction



View Text Solution

**27.** In a shopping mall there is a hall of cuboid shape with dimension $800x \times 800x \times 720$ units, which needs to be added the facility of an escalator in the path as shown by the dotted line in the figure. Find the slopes of the

escalator at the turning points.



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Exercise 6 3

**1.** Find the equation of the straight line parallel to $5x - 4y + 3 = 0$ and having x-intercept 3.

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**2.** Find the distance between the line $4x + 3y + 4 = 0$, and a point $(-2, 4)$

View Text Solution

**3.** Find the distance between the line $4x + 3y + 4 = 0$, and a point $(7,-3)$

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**4.** Write the equation of the lines through the point $(1, -1)$

parallel to $x + 3y - 4 = 0$

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**5.** Write the equation of the lines through the point $(1, -1)$

perpendicular to $3x + 4y = 6$

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**6.** If $(-4, 7)$ is one vertex of a rhombus and if the equation of one diagonal is $5x - y + 7 = 0$, then find the equation of another diagonal.

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**7.** Find the equation of the lines passing through the point of intersection lines $4x - y + 3 = 0$ and $5x + 2y + 7 = 0$, and through the point $(-1, 2)$

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**8.** Find the equation of the lines passing through the point of intersection lines $4x - y + 3 = 0$ and $5x + 2y + 7 = 0$, and Parallel to $x - y + 5 = 0$

View Text Solution

**9.** Find the equation of the lines passing through the point of intersection lines $4x - y + 3 = 0$ and $5x + 2y + 7 = 0$, and Perpendicular to $x - 2y + 1 = 0$

View Text Solution

**10.** Find the equations of two straight lines which are parallel to the line $12x + 5y + 2 = 0$ and at a unit distance from the point $(1, -1)$.

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**11.** Find the equations of straight lines which are perpendicular to the line $3x + 4y - 6=0$ and are at a distance of 4 units from (2, 1).

View Text Solution

**12.** . Find the equation of a straight line parallel to $2x + 3y = 10$ and which is such that the sum of its intercepts on the axes is 15.

View Text Solution

**13.** Find the length of the perpendicular and the co-ordinates of the foot of the perpendicular from (−10, −2) to the line x + y − 2=0.

View Text Solution

**14.** Find the distance between the parallel lines

$12x + 5y = 7$ and $12x + 5y + 7 = 0$

View Text Solution

**15.** Find the distance between the parallel lines

$3x - 4y + 5 = 0$ and $6x - 8y - 15 = 0$.

View Text Solution

**16.** Find the family of straight lines Perpendicular

View Text Solution

**17.** Find the family of straight lines Parallel to $3x + 4y - 12 = 0$.

View Text Solution

**18.** If the line joining two points A(2,0) and B(3,1) is rotated about A in anticlockwise direction through an angle of 15o, then find the equation of the line in new position.

View Text Solution

**19.** A ray of light coming from the point (1,2) is reflected at a point A on the x-axis and it passes through the point (5,3). Find the co-ordinates of the point A

View Text Solution

**20.** A line is drawn perpendicular to $5x = y + 7$. Find the equation of the line if the area of the triangle formed by this line with co-ordinate axes is 10 sq. units.

View Text Solution

**21.** Find the image of the point (−2, 3) about the line $x + 2y - 9 = 0$

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**22.** A photocopy store charges Rs 1.50 per copy for the first 10 copies and Rs 1.00 per copy after the 10th copy. Let x be the number of copies, and let y be the total cost of

photocopying. Draw graph of the cost as x goes from 0 to 50 copies.

View Text Solution

**23.** A photocopy store charges Rs 1.50 per copy for the first 10 copies and Rs 1.00 per copy after the 10th copy. Let x be the number of copies, and let y be the total cost of photocopying. Find the cost of making 40 copies

View Text Solution

**24.** Find atleast two equations of the straight lines in the family of the lines $y = 5x + b$, for which b and the x-coordinate of the point of intersection of the lines with $3x - 4y = 6$ are integers

View Text Solution

**25.** Find all the equations of the straight lines in the family of the lines $y = mx - 3$, for which m and the x-coordinate of the point of

intersection of the lines with $x - y = 6$ are integers.

View Text Solution

## Exercise 6 4

**1.** Find the combined equation of the straight lines whose separate equations are $x - 2y - 3=0$ and $x + y +5=0$.

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**2.** Find the equation of the pair of straight lines passing through the point (1, 3) and perpendicular to the lines 2x − 3y +1=0 and 5x + y − 3=0

View Text Solution

**3.** Find the separate equation of the following pair of straight lines

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

View Text Solution

**4.** Find the separate equation of the following pair of straight lines

$$6(x-1)^2+5(x-1)(y-2)-4(y-2)^2=0$$

View Text Solution

**5.** Find the separate equation of the following pair of straight lines

$$2x^2-xy-3y^2-6x+19y-20=0$$

View Text Solution

**6.** A $\Delta OPQ$ is formed by the pair of straight lines $x^2 + 4xy + y^2 = 0$ and the line P Q. The equation of P Q is x + y − 2=0. Find the equation of the median of the triangle $\Delta OPQ$ drawn from the origin O.

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**7.** Find p and q, if the following equation represents a pair of perpendicular lines

$6x^2 + 5xy - py^2 + 7x + qy - 5 = 0$

View Text Solution

**8.** Find the value of k, if the following equation represents a pair of straight lines. Further, find whether these lines are parallel or intersecting,

$12x^2 + 7xy - 12y^2 - x + 7y + k = 0$

View Text Solution

**9.** For what value of k does the equation

$12x^2 + 2kxy + 2y^2 + 11x - 5y + 2 = 0$

represent two straight lines.

View Text Solution

**10.** Show that the equation $9x^2 - 24xy + 16y^2 - 12x + 16y - 12 = 0$ 0 represents a pair of parallel lines. Find the distance between them.

View Text Solution

**11.** Show that the equation

$4x^2 + 4xy + y^2 - 6x - 3y - 4 = 0$

represents a pair of parallel lines. Find the distance between them.

View Text Solution

## Exercise 6 5 Choose The Correct Or More Suitable Answer

**1.** The equation of the locus of the point whose distance from y-axis is half the distance

from origin is

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

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

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

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

**Answer: D**

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**2.** Which of the following equation is the locus of $(at^2, 2at)$

A. $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

B. $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

C. $x^2 + y^2 = a^2$

D. $y^2 = 4ax$

**Answer: D**

View Text Solution

**3.** Which of the following point lie on the locus of $3x^2 + 3y^2 - 8x - 12y + 17 = 0$

A. (0, 0)

B. (−2, 3)

C. (1, 2)

D. (0, −1)

**Answer: C**

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**4.** If the point (8,−5) lies on the locus $\frac{x^2}{16} = \frac{y^2}{25} = k$ then the value of k is

A. 0

B. 1

C. 2

D. 3

**Answer: D**

View Text Solution

**5.** Straight line joining the points (2, 3) and (−1, 4) passes through the point $(\alpha, \beta)$ if

A. $\alpha + 2\beta = 7$

B. $3\alpha + \beta = 9$

C. $\alpha + 3\beta = 11$

D. $3\alpha + \beta = 11$

**Answer: C**

View Text Solution

**6.** The slope of the line which makes an angle $45^\circ$ with the line 3x-y=-5 are

A. 1,-1

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

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

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

**Answer: B**

View Text Solution

**7.** Equation of the straight line that forms an isosceles triangle with coordinate axes in the I-quadrant with perimeter $4 + 2\sqrt{2}$ is

A. x + y +2=0

B. x + y − 2=0

C. $x + y - \sqrt{2} = 0$

D. $x + y + \sqrt{2} = 0$

**Answer: B**

View Text Solution

**8.** The coordinates of the four vertices of a quadrilateral are (−2,4), (−1,2), (1,2) and (2,4) taken in order.The equation of the line passing through the vertex (−1,2) and dividing the quadrilateral in the equal areas is

A. $x+1=0$

B. $x+y=1$

C. $x+y+3=0$

D. $x-y+3=0$

**Answer: D**

View Text Solution

**9.** The intercepts of the perpendicular bisector of the line segment joining (1, 2) and (3,4) with coordinate axes are

A. 5,-5

B. 5,5

C. 5,3

D. 5,-4

**Answer: B**

View Text Solution

**10.** The equation of the line with slope 2 and the length of the perpendicular from the origin equal to $\sqrt{5}$ is

A. $x + 2y = \sqrt{5}$

B. $2x + y = \sqrt{5}$

C. $2x + y = 5$

D. $x + 2y - 5 = 0$

**Answer: C**

View Text Solution

**11.** A line perpendicular to the line 5x – y = 0 forms a triangle with the coordinate axes. If the area of the triangle is 5 sq. units, then its equation is

A. $x + 5y \pm 5\sqrt{2} = 0$

B. $x - 5y \pm 5\sqrt{2} = 0$

C. $5x + y \pm 5\sqrt{2} = 0$

D. $5x - y \pm 5\sqrt{2} = 0$

**Answer: A**

View Text Solution

**12.** Equation of the straight line perpendicular to the linex−y+5 = 0, through the point of intersection the y-axis and the given line

A. $x - y - 5=0$

B. $x + y - 5=0$

C. $x + y +5=0$

D. $x + y + 10 = 0$

**Answer: B**

View Text Solution

**13.** If the equation of the base opposite to the vertex (2, 3) of an equilateral triangle is x + y = 2, then the length of a side is

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

B. 6

C. $\sqrt{6}$

D. $3\sqrt{2}$

**Answer: C**

View Text Solution

**14.** The line $(p + 2q)x + (p - 3q)y = p - q$ for different values of p and q passes through the point

A. $\left((3), \frac{5}{2}\right)$

B. $\left(\frac{2}{5}, \frac{2}{5}\right)$

C. $\left(\frac{3}{5}, \frac{3}{5}\right)$

D. $\left(\frac{2}{5}, \frac{3}{5}\right)$

**Answer: D**

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**15.** The point on the line $2x - 3y = 5$ is equidistance from (1,2) and (3, 4) is

A. (7,3)

B. (4,1)

C. (1,-1)

D. (-2,3)

**Answer: B**

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**16.** The image of the point (2, 3) in the line y = −x is

A. (−3, −2)

B. ( −3, 2 )

C. ( −2, −3)

D. ( 3, 2 )

**Answer: A**

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**17.** The length of $\perp$ from the origin to the line $\frac{x}{3} - \frac{y}{4} = 1$ is

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

B. $\frac{5}{12}$

C. $\frac{12}{5}$

D. $-\frac{5}{12}$

**Answer: C**

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**18.** The y-intercept of the straight line passing through (1,3) and perpendicular to 2x − 3y +1=0 is

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

B. $\frac{9}{2}$

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

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

**Answer: B**

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**19.** If the two straight lines x + (2k – 7)y +3=0 and 3kx + 9y – 5=0 are perpendicular then the value of k is

A. k=3

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

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

D. $k = \frac{3}{2}$

**Answer: A**

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**20.** If a vertex of a square is at the origin and its one side lies along the line $4x + 3y - 20 = 0$, then the area of the square is

A. 20 sq. units

B. 16 sq. units

C. 25 sq. units

D. 4 sq. units

**Answer: B**

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

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

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

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

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

**Answer: A**

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**22.** The area of the triangle formed by the lines $x^2 - 4y^2 = 0$ and $x = -a$ is

A. $2a^2$

B. $\frac{\sqrt{3}}{2}a^2$

C. $\frac{1}{2}a^2$

D. $\frac{2}{\sqrt{3}}a^2$

**Answer: C**

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

A. $-3$

B. $-1$

C. 3

D. 1

**Answer: A**

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**24.** $\theta$ is acute angle between the lines $x^2 - xy - 6y = 0$ then $\frac{2\cos\theta 3 + \sin\theta}{4\sin\theta + 5\cos\theta}$ is

A. 1

B. $-\frac{1}{9}$

C. $\frac{5}{9}$

D. $\frac{1}{9}$

**Answer: C**

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**25.** The equation of one the line represented by the equation $x^2 + 2xy\cot\theta - y^2 = 0$ is

A. $x - y\cot\theta = 0$

B. $x + y\tan\theta = 0$

C. $x\cos\theta + y(\sin\theta + 1) = 0$

D. $x\sin\theta + y(\cos\theta + 1) = 0$

**Answer: D**

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