

Maths assignment

Class X

Application of trigonometry

Q1. The angle of elevation of the top of a 12m tall building from a point A on the ground is 30° . A flag is hosted at the top of the building and the angle of elevation of the flag staff from A is 45° . Find the length of flag staff and the distance of the building from A?

Q2. The angles of depression of the top and bottom of a 10m tall building from the top of a tower are 30° and 45° respectively . find the height of opposite house?

Q3 from a window 60m high above the ground level of a house in a street , the angles of elevation and depression of the of the top and foot of other house opposite side of the street are 60° and 45° respectively. Find the height of the opposite house?

Q4. A man on the deck of ship 18m above the water level observes that the angle of elevation and depression respectively of the foot and top of the cliff are 60° and 30° . Find the distance of the cliff from the ship and height of the cliff?

Q5. A flight pole 4m high is fixed on the top of a tower . the angle of elevation of the top of the pole observed from the point A on the ground is 60° and angle of depression of the point A from the top of the tower is 45° . Find the height of the tower?

Q6. A man on a cliff observes a boat at an angle of depression of 30° which is approaching the shore to the point A on the immediately beneath the observer with a uniform speed . 12 minute later the angle of depression of the boat is found to be 60° . Find the time taken by the boat to reach the shore?

Q7 A person standing on the bank of a river observes that the angle subtended by a tree on the opposite bank is 60° when he retires 30m from the bank he find the angle to be 30° . Find the breadth of the river and the height of tree?

Q8. An aeroplane at an altitude of 100m observes the angle of depression of opposite points on the two banks of a river to be 30° and 45° . Find the width of the river?

Q9. A ladder rests against a wall at an angle α to the horizontal . its foot is pulled away from the wall through a distance m so that it slides a distance n down the wall making an angle β with the horizontal,

$$\frac{m}{n} = \frac{\cos\beta - \cos\alpha}{\sin\alpha - \sin\beta} ?$$

Maths assignment

Class X

Areas related to circle

- Q1. The circumference of a circle exceeds its diameter by 16.8 cm, what is the diameter of the circle?
- Q2. If the perimeter of the protector is 108cm, then what is its radius?
- Q3. The length of an arc of a circle with radius 12cm is 10π cm. What is the angle measure of this arc?
- Q4. A car has wheels which are 80cm in diameter how many complete revolutions does each wheel make in 10 minutes when the car is moving at a speed of 80km/hr?
- Q5. Two circles touch internally . the sum of their areas is $116\pi\text{cm}^2$ and distance between there centres is 6cm. find the radii of these circles?
- Q6. A chord of a circle of diameter 20cm substend an angle of 120° at the centre of circle . find the area of corresponding segment of the circle?
- Q7. A chord of a circle of radius 14cm substend an angle of 120° at the centre . find the area of corresponding minor segment and major sector of the circle?
- Q8. There are two concentric circular trackes of radii 100m and 102 m respectively arun runs on inner track and goes one round the track in $1\frac{1}{2}$ minutes while tarun runs on the outer track in 1 minute and 32 second who run faster of the two?
- Q9. The area of an equilateral triangle is $49\sqrt{3}\text{ cm}^2$. Taking each angular point as centre circles are drawn with radius equal to half the length of the sides of the triangle. Find the area not included in the circle?
- Q10. A race track is in the form of a ring enclosed by two concentric circles. The outer circle and inner circle circumference are 616m and 528m respectively. Find the width and area of the track ?
- Q11. The perimeter of a certain sector of a circle of radius 5.7cm is 27.2m. find the area of the sector?
- Q12. A boy is cycling such that the wheel of the cycle are making 140 revolutions per minute . if the diameter of the wheel is 60cm, find the speed per hour with which the boy is cycling?
- Q13. In a circle of radius 21cm, an arc subtends an angle of 60° at the centre . find
- i). the length of the arc
 - ii). Area of the sector formed by the arc
 - iii). The area of the segment made by this arc?

Maths assignment

Class – X

Arithmetic progression

- Q1. Find the 19th and 20th term of the sequence defined by ; n^2 when n is even; n^{2+1} when n is odd?
- Q2. The fourth term of an A.P. is equal to 3 times the first term and seventh term exceeds twice the third term by 1. Find the first term and common difference of the A.P.?
- Q3. Find an A.P. of 8 terms whose first term is $\frac{1}{2}$?
- Q4. For an A.P. a_1, a_2, a_3, \dots . If $\frac{a_4}{a_7} = \frac{2}{3}$, then find $\frac{a_6}{a_8}$?
- Q5. 2nd, 31st and last term of an A.P. are $\frac{31}{4}, \frac{1}{2}, \frac{13}{2}$ respectively. Find the number of terms in the A.P.?
- Q6. Find the sum of first 30 terms of an A.P. whose n^{th} term is $2-3n$?
- Q7. Find the sum of A.P. :- $6+ 10+ 14+ \dots+ 102$?
- Q8. If m^{th} and n^{th} terms of an A.P. are $\frac{1}{n}$ and $\frac{1}{m}$ respectively, then find the sum of mn terms?
- Q9. Find the sum of all the three digit numbers each of which leaves the remainder 3 when divided by 5?
- Q10. A picnic group consists of students whose ages are in A.P. the common difference being 3 months. If the youngest student is just 7 years old and the sum of ages of all the students is 250 years. Find the number of students in the group?
- Q11. If n^{th} term of an A.P. is 4, common difference is 2 and sum of n terms is -14, then find first term and number of terms?
- Q12. The sum of n terms of two A.P. are in the ratio $3n+8 : 7n+15$. Find the ratio of 12th terms?
- Q13. The sum of first six terms of an A.P. is 42. The ratio of the 10th term to the 30th term is 1:3. Find the first term and 11th term of the A.P.?
- Q14. The sum of three terms in A.P. is 24 and their product is 440. Find the numbers?

Maths assignment

Class X

Circles

- Q1. Three tangents are drawn to a circle with centre o in such a way that two of them are parallel to each other and third tangent intersect them at point P and Q respectively prove that $\angle POQ = 90^\circ$?
- Q2. In a right triangle ABC , a circle with side AB as diameter is drawn to intersect the hypotenuse AC in P. prove that $PB = PC$ /
- Q3. Prove that in two concentric circles , the chord of the larger circle , which touches the smallest circle , is bisected at the point of contact?
- Q4. Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre?
- Q5. find the length of tangent drawn from a point P whose distance from the centre of the circle is 25cm. it is given that radius of circle is 7cm/
- Q6. Prove that the tangent drawn to a circle at the end points of the diameter are parallel to each other?
- Q7. A circle touches all the four sides of a quadrilateral ABCD , prove that $AB + CD = BC + AD$?
- Q8. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the point of contact at the centre?
- Q9. A circle touches the side BC of a triangle ABC at P and also touches the side AB and AC produced at Q and R respectively . prove that $AQ = \frac{1}{2}(\text{perimeter of } \triangle ABC)$?
- Q10. Prove that the length of tangents drawn from an external point to a circle are equal. Using this statement solve this question? Two concentric circles are of radii 5cm and 3cm. find the length of the chord of the larger circle which is tangent to the smaller circle?

Maths assignment

Class X

Construction

- Q1. Draw a line segment $AB = 4.8$ and find a point P on AB such that $AP = \frac{1}{4} AB$?
- Q2. Construct a triangle ABC with side $AB = 4\text{cm}$, $BC = 5\text{cm}$ and $AC = 6\text{cm}$ draw a $\Delta AB'C'$ similar to ΔABC such that $AB' = \frac{2}{3}AB$?
- Q3. Construct an isosceles triangle ABC , with base 3.9 cm and each equal side being 3.5cm . draw a triangle similar to ABC such that its side are $\frac{3}{2}$ of the corresponding sides of ΔABC ?
- Q4. Draw a circle of radius 3cm . take two points P and Q on one of its extended diameter each at a distance of 7cm from its centre. Draw tangents to the circle from these two points?
- Q5. Draw a right triangle in which the sides containing the right angle are 5cm and 4cm . construct a triangle similar to the triangle whose sides are $\frac{5}{3}$ times the corresponding sides of the above triangle?
- Q6. draw a pair of tangent to a circle of radius 3cm which is inclined to each other at an angle of 60° ?
- Q7. Draw a circle of radius 5cm . from a point P which is 13cm away from its centre , draw two tangents to the circle?
- Q8. Draw two concentric circles of radii 3cm and 5cm . construct a tangent to tangent to smaller circle from a point on the larger circle. Also measure its length?
- Q9. Construct a triangle ABC with base $BC = 4.2\text{cm}$, $\angle A = 45^\circ$ and altitude through A is 2.5cm . draw another triangle similar to this triangle with scaier factor $\frac{1}{2}$?
- Q10. Draw a circle of diameter 6cm . from a point 5cm away from from the centre of the circle, draw two tangents to the circle . measure their length and verify that they are equal in length?

Maths assignment

Class X

Co-ordinate Geometry

- Q1. The three coordinates of a parallelogram PQRS are P(-3, 1), Q(1,1), and R(3,2). Find coordinates of S?
- Q2. If A(-3,2), B(x,y) and C(1,4) are the vertices of an isosceles triangle with AB = BC. Show that $2x+y=1$?
- Q3. Prove that the figure obtained on joining the mid points of parallelogram PQRS is a rectangle where P(1,0), Q(5,3), R(2,7) and S(-2,4)?
- Q4. Find the length of perpendicular from X(0,6) on YZ, where coordinates of Y and Z are (-5,-3) and (-11,3) ?
- Q5. Find the coordinates of circumcentre of the triangle whose vertices are (0,0), (8,0) and (0,6). Also find the circumradius?
- Q6. If the point (6,4) divides the line segment joining L(8,5), and M(a,f) in the ratio 2:5. Find the value of a and b and also find the coordinates of the mid point?
- Q7. If the coordinates of two adjacent vertices of a parallelogram are (3,2) and (-1,0) and the diagonal cut each other at (2,-5). Find the coordinates of the other two vertices of the parallelogram?
- Q8. In what ratio, the line joining (1,3) and (2,7) is divided by $3x+y=9$?
- Q9. The join of D(-4,0) and E(0,6) is divided by A(p,2) and $B(\frac{-4}{3}, q)$ in three equal parts . find the values of p and q?
- Q10. For what value of C the centroid of the triangle with vertices P(1,a), Q(2,f) and $R(C^2, -3)$ lies on Y-axis?
- Q11. If the vertex P of a triangle PQR is (-1,2) and the mid point of PQ and PR are (-1,0) & $(\frac{1}{2}, \frac{3}{2})$ find the coordinates of Q & R?
- Q12. Length of line segment is $\sqrt{34}$ units. If one end is at (4,2) & the ordinate of the second end is 5, show that its abscissa is either -1 or 9?
- Q13. (6,-10), (-8,14) & (-4,-2) are the coordinates of the mid points of a triangle. Find the coordinates of the vertices of the triangle?

Maths assignment

Class X

Linear equation in two variable

Q1. Find the value of "K" for which the following system of equations have infinitely many solutions:-

$$X + (K+1)Y = 4 \quad ; \quad (K+1)X + 9Y = 5K + 2$$

Q2. Sum of two numbers is 35. If their difference is 13, find the numbers?

Q3. Obtain the condition of the following system of linear equations to have a unique solution :-

$$Ax + by + c = 0 \quad ; \quad lx + my + n = 0$$

Q4. The sum of two numbers is 8. If their sum is four times their difference, find the numbers?

Q5. Find the value of K for which the following system of equations have infinite many solutions:-

$$2x + 3y = K \quad ; \quad (k-1)x + (k+2)y = 3k$$

Q6. For what value of K the system of linear equations $x + 2y = 5$, $3x + ky + 15 = 0$ has

- (i) A unique solution (ii). No solution

Q7. Solve for x and y ; $2x - y = 2$, $3y - 4y + 2 = 0$

Q8. A father is three times as old as his son . after 12 years he will be twice as old as his son . find the present age of the father and son?

Q9. Show graphically that the system of linear equations $5x - y = 14$; $x - 2y = 1$ has a unique solution. write the coordinates where the line $x - 2y = 1$ intersects the X-axis?

Q10. Solve the following system of linear equations graphically:- $2x - y = 4$; $x + y + 1 = 0$. Find the points where the lines meet the X-axis?

Q11. Show graphically that the system of equations $3x - y = 2$; $6x - 2y = 4$ has infinite many solutions?

Q12. Solve for X and Y :- $\frac{1}{2x} - \frac{1}{y} = -1$; $\frac{1}{x} + \frac{1}{2y} = 8$?

Q13. solve for x and y :- $\frac{6}{x+y} - \frac{7}{x-y} = 3$; $\frac{1}{2(x+y)} = \frac{1}{3(x-y)}$?

Maths assignment

Class X

Polynomial

- Q1. Find the polynomial whose zeros are $\frac{1}{2}$ and $\frac{-3}{7}$?
- Q2. Find the remainder when polynomial $3x^2 - x^3 - 3x + 5$ is divided by the polynomial $x - x^2 - 1$?
- Q3. Find the polynomial whose zeros are $3 \pm \sqrt{2}$?
- Q4. Find the polynomial whose zeros are $\pm\sqrt{5}$?
- Q5. Find the zeros of the polynomial $25x^2 - 15x + 2$?
- Q6. Find the zeros of the quadratic polynomial $x^2 + 4\sqrt{2} + 6$?
- Q7. Find the zeros of the quadratic polynomial $x^2 + 6\sqrt{6}x + 48$?
- Q8. Find the quadratic polynomial whose zeros are $\frac{5}{2}\sqrt{3}$ and $\frac{1}{3\sqrt{3}}$?
- Q9. Using division algorithm check whether the polynomial $g(x) = x^2 + x + 3$ is a factor of the polynomial $p(x) = x^4 + x^3 - 2x^2 - 5x - 12$?
- Q10. Using division algorithm , find quotient $q(x)$ and remainder $r(x)$ if $f(x)$ is divided by $g(x)$.
- $f(x) = x^3 - x^2 + 4x - 8$; $g(x) = x + 3$?
- Q11. If $(x+a)$ is a factor of polynomials $x^2 + ix + m$ and $x^2 + nx + k$ then prove that $a = \frac{m-k}{i-n}$?
- Q12. Find all the zeros of the polynomial $3x^4 - 15x^3 + 17x^2 + 5x - 6$ if two zeroes of the polynomials are $\pm \frac{1}{\sqrt{3}}$?
- Q13. On dividing $2x^3 + 4x^2 + 5x + 7$ by a polynomial $g(x)$ the quotient and remainder are $2x$ and $7 - 5x$ respectively, find $g(x)$?
- Q14. If polynomial $x^4 + x^3 + 6x^2 + ax + b$ is exactly divisible by another polynomials $x^2 + 1$ find the value of a and b ?
- Q15. Find all the zeros of polynomials $x^4 + x^3 - 7x^2 - 5x + 10$ if two of the zeros are $\pm\sqrt{5}$?

Maths assignment

Class x

Chapter- probability

Q1. During IPL cricket tournament, a match is played between Delhi Dare Devils and Knight Riders. If probability of Dare Devils winning the match is 0.579 . write the probability of Knight Riders winning the match?

Q2. Only face cards are well shuffled . a card is drawn at random . write the probability of getting a queen.

Q3. A CD bag contains 60 VCD's and DVD's. if probability of getting a DVD's at random is $\frac{2}{3}$. write the probability of getting a VCD?

Q4. Two dice are rolled once. Write the probability of getting a doublet?

Q5. in a family f two children , write the probability of at least one boy?

Q6. What is the probability of getting a vowel at random out of the box containing cads of English Vowel?

Q7. A box contains 12 coloured candles equal in number of red, green and blue. Write the probability of getting a candle other than red?

Q8. A garden has different plants . every sixth plant is a rose plant. A child plucks a flower , write the probability of getting a flower other than rose?

Q9. A bank ATM has 2000 notes of Rs 500 and 3000 notes of Rs 1000. Write the probability if a person withdraws Rs1000 and he get Rs 1000 note?

Q10. A bank ATM has notes of denomination 100, 500,1000 in equal numbers. What is the probability of getting a note of Rs 1000?

Q11. Two dice are rolled once. Write the probability of getting sum numbers more than second multiple of 7?

Q12. Two dice are rolled once. Write the probability of getting a numbers whose product is perfect square?

Q13. Two dice are rolled simultaneously. Find the probability that the sum is more than 10?

Q14. Find the probability of of having 53 Mondays in a leap years?

Q15. A box contains 15 red and 10 green pens:- a). find probability of drawing a green pen at random?

b). if 5 more green pen are put in the box , find the probability of drawing a red pen?

Maths assignment

Class X

QUADRATIC EQUATION

Q1. Represent the following statements in the form of an equation:-

a). the sum of squares of two consecutive even numbers is 100?

b). 10 is divided into two parts such that the sum of their reciprocals is $\frac{5}{12}$?

c). the sum of reciprocal of rehman's age 3 years ago and 5 years from now is $\frac{1}{3}$?

Q2. Write discriminant of the quadratic equation $\sqrt{3}x^2 - 2\sqrt{2}(x+1) - 2\sqrt{2} = 0$?

Q3. State whether roots of quadratic equation $3a^2x^2 + 8abx + 4b^2 = 0$ are real or not?

Q4. Some students arranged a picnic, the budget for food was Rs 240. Because four students of group failed to go. The cost of food for each student increased by Rs 5 frame a quadratic equation for the statement?

Q5. If one of the roots of $2x^2 + 3x + K = 0$ is $\frac{1}{2}$ find the value of K and other root?

Q6. Solve the following equations by using factorization method :-

i). $(2y + 3)^2 = 81$ ii). $\frac{x-1}{x-2} + \frac{x-3}{x-4} = 3\frac{1}{3}$?

Q7. Solve the following equation by using quadratic formula :-

i). $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ ii). $(3x + a)(3x + b) = ab$

Q8. Find the root of following equation by completing whole square method:-

i). $2x^2 - 5x + 3 = 0$ ii). $2x^2 + x - 4 = 0$

Q9. A two digit number is such that the product of its digit is 35. When 18 is added to the number, the digits interchange their places. Find the number?

Q10. Find the value of K so that the following equations has equal roots :- $2x^2 - (k-2)x + 1 = 0$?

Q11. The sum of squares of three consecutive numbers is 149. Find the numbers?

Maths assignment

Class x

Real number

- Q1. Find the greatest number which divides 285 and 1249 leaving remainder 9 and 7 respectively?
- Q2. Two brands of chocolates are available in pack of 24 and 15 respectively. If I need to buy an equal number of chocolates of both kinds, what is the least number of boxes of each kind I would need to buy?
- Q3. Find the H.C.F. and LCM of 96 and 240?
- Q4. Write two irrational numbers whose sum is rational?
- Q5. Show that $2 - \sqrt{3}$ is irrational?
- Q6. Show that $\sqrt{3}$ is an irrational number?
- Q7. Check whether 4^n can end with the digit 0 for any natural number n?
- Q8. Show that $3\sqrt{5}$ is an irrational number?
- Q9. Show that $\sqrt{2} + \sqrt{3}$ is an irrational?
- Q10. Show that any positive odd integer is of the form $4q + 1$ or $4q + 3$, where q is some positive integer?
- Q11. The length, breadth and height of a room are 8m25cm, 6m75cm and 4m50cm respectively. Determine the longest rod which can measure the three dimensions of the room exactly?
- Q12. Show that $3 + \sqrt{5}$ is an irrational number?
- Q13. Find the largest number that will divide 398, 436 and 540 leaving remainder 7, 11 and 13 respectively?
- Q14. Show that $7\sqrt{2} - 3$ is irrational?

Maths assignment

Class x

Statistics

Q1. The following table shows the daily wages of 25 workers

Daily wages	100-150	150-200	200-250	250-300	300-350
No. of workers	5	2	12	3	3

Find the mean and median by suitable method?

Q2. Consider the following distribution which shows weekly allowance of 30 children of a locality

Weekly allowance	100-120	120-140	140-160	160-180	180-200
No. of children	2	6	9	x	3

Find the value of "x", mean and median?

Q3. The mean of the following distribution is 50. Find the missing frequency x and y sum of frequency is 120.

Class intervals	0-20	20-40	40-60	60-80	80-100
Frequency	17	X	32	y	19

Q4. find the mean and mode of the following frequency distribution:-

Class interval	10-19	20-29	30-39	40-49	50-59	60-69
Frequency	5	9	10	8	5	3

Q5. Find the mean of the following data:-

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
No. of student	7	17	40	91	97	100

Q6. Find the missing frequency of the following data if the mode is Rs240

Expenditure	0-100	100-200	200-300	300-400	400-500
No. of families	140	230	270	x	150

Q7. Find the median and the mode for the following table, which shows number of persons for different age group:-

Age group	0-20	20-40	40-60	60-80	80-100	Total
No of persons	17	28	32	24	19	150

Q8. Calculate median and mode age of the following distribution:-

Age	<20	<25	<30	<35	<40	<45	<50	<55	<60
Persons	2	6	24	45	78	89	92	98	100

Q9. If median of the distribution given below is 28.5. find the value of X and Y. total frequency is 56

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	X	20	15	Y	5

Q10. Find the mean, median and mode of the following distribution:-

No. of class	0	1	2	3	4	5
No. of match	2	4	7	6	8	3

Q11. Calculate the mean, median and mode for the following distribution:-

classinterval	0-10	10-20	20-30	30-40	40-50	50-60
frequency	2	6	9	7	4	2

Q12. The following distribution gives the marks obtained by 45 students in a test:-

Marks	0-20	20-40	40-60	60-80	80-100
No. of students	10	20	8	5	3

Convert the above distribution to a less than type cumulative frequency distribution and draw its Ogive?

Q13. Draw the Ogive for the following distribution given below:-

Class	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Frequency	4	4	7	20	12	8	5

Also find the median for the Ogive so drawn.

Q14. The following observations relate to the marks obtained out of 100 by 50 students in a certain examination

Marks	10-20	20-30	30-40	40-50	50-60	60-70
No. of students	6	7	9	10	8	7

i). draw less than type cumulative frequency distribution curve and its Ogive.

ii). Draw more than type cumulative frequency distribution and its Ogive.

ii). Obtain the median from the graph and verify the result by using the median formula.

Maths assignment

Class X

Surface area and volume

- Q1. The volume of a hemisphere is $2425\frac{1}{2} \text{ cm}^3$. Find the total surface area?
- Q2. If the radii of the circular ends of conical bucket which is 45cm high are 28cm and 7cm, find the capacity of the bucket?
- Q3. A toy is in the shape of a cone mounted on a hemisphere . the diameter of the base of the cone is 7 cm and its height is 14.5 cm. find the volume and surface area of the toy?
- Q4. The dimensions of metallic cuboid are 100cmx80cmx64cm. it is melted and recast into a cube . find the surface area of the cube?
- Q5. Marbles of diameter 1.4cm are dropped into a cylinder beaker of diameter 7cm containing some water. Find the number of marbles dropped so that water level rises by 5.6cm?
- Q6. A farmer connects a pipe of internal diameter 20cm from a canal into a cylindrical tank in his field which is 10m in diameter and 2m deep. If the water flows through the pipe at the rate of 6km/hr in how much time will the tank be filled?
- Q7. 50 circular plates , each of radius 7cm, and thickness 0.5cm are placed one above the other to form a cylinder . find the total surface area and the volume of the cylinder?
- Q8. Water is being pumped out through a circular pipe whose internal diameter is 7cm. if the flow of water is 72cm/sec, how many litres of water are being pumped out in one hour?
- Q9. A bucket is in the form of frustum of a cone and it can hold 28.49 litres of water. If the radii of its circular ends are 28cm and 21 cm , find the height of the bucket?
- Q10. A circus tent is cylindrical to a height of 3m and conical above it. If its diameter is 105m and slant height of the cone is 53m calculate the area of canvas required to make the tent?
- Q11. A hollow cone is cut by a plane parallel to the base and the upper portion is removed . if the curved surface of remainder is $\frac{8}{9}$ of the curved surface of the whole cone, find the ratio of the line segment into which the cones's altitude is divided by the plane?
- Q12. A milk container is made of metal sheet in the shape of frustum of cone whose volume is $10459\frac{3}{7} \text{ cm}^3$ the radii of its lower and upper ends are 8cm and 20cm respectively. Find the cost of metal sheet used in making the container at the rate of Rs 1.40 per square centimeters?