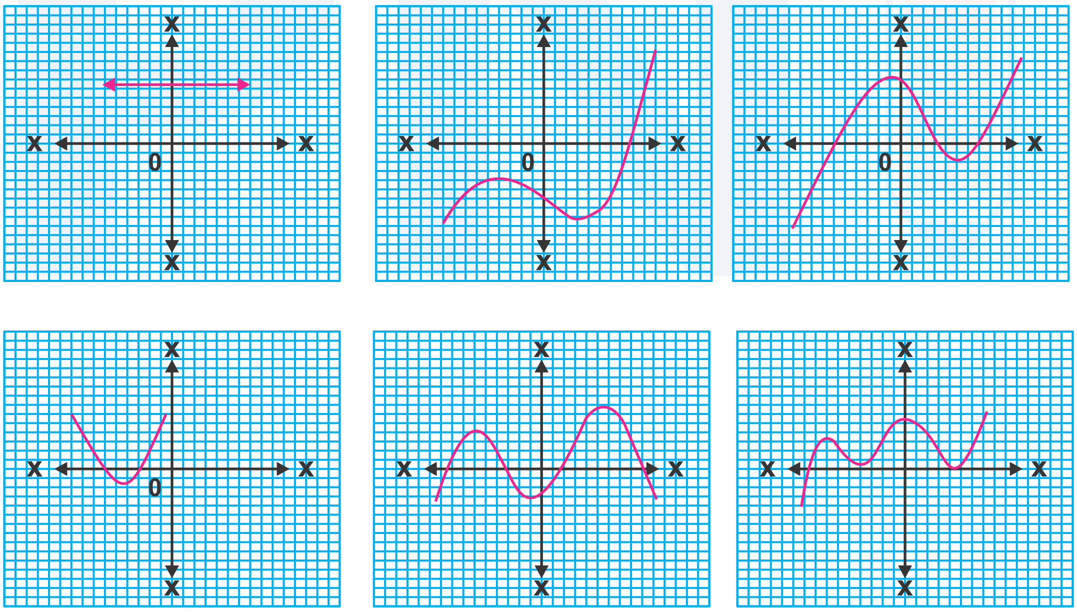
CHAPTER- 1 REAL NUMBERS

1. Use Euclid's algorithm to find the HCF of 4052 and 12576.
2. Use Euclid's division algorithm to find the HCF of : (A) 135 and 225 (B) 867 and 255
3. Find the HCF and LCM of 6, 72 and 120, using the prime factorization method.
4. Express each number as a product of its prime factors: (A) 3825 (B) 5005 (C) 7429
5. Find the LCM and HCF of the following integers by applying the prime factorization method. (A) 17, 23 and 29 (B) 12, 15 and 21
6. Given that HCF (306, 657) = 9, find LCM (306, 657).

CHAPTER- 2 POLYNOMIALS

1. The graphs of y = p(x) are given in Fig. 2.10 below, for some polynomials p(x). Find the number of zeroes of p(x), in each case.



2. Find the zeroes of the polynomial X^2-3 and verify the relationship between the zeroes and the coefficients.
3. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. (A) ?4s?^2-4s+1 (B) ?6X?^2-3-7X ©

?4u?^2+8u (D) ?3x?^2-x-4

4. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively. (A) 1/4 , -1 (B)?2, 1/3 (C) -1/4, ¼

CHAPTER- 3 PAIR OF LINEAR EQUATION IN TWO VARIABLES

1. Two rails are represented by the equations $x + 2y – 4 = 0$ and $2x + 4y – 12 = 0$. Represent this situation geometrically.
2. Check graphically whether the pair of equations $x + 3y = 6$ and $2x – 3y = 12$ is consistent. If so, solve them graphically.
3. On comparing the ratios (a1/a2) , (b1/b2) , (c1/c2) find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincident:

(A) $9x + 3y + 12 = 0; 18x + 6y + 24 = 0$ (B) $6x – 3y + 10 = 0; 2x – y + 9 = 0$

4. On comparing the ratio, (a1/a2) , (b1/b2) , (c1/c2) find out whether the following pair of linear equations are consistent, or inconsistent.

(A) $(3/2)x+(5/3)y = 7; 9x – 10y = 14$

(B) $5x – 3y = 11 ; – 10x + 6y = –22$

(C) $(4/3)x+2y = 8 ; 2x + 3y = 12$

5. Solve the following pair of equations by substitution method: $7x – 15y = 2; x + 2y = 3$
6. Solve the following pair of linear equations by the substitution method. (A) $s – t = 3; (s/3) + (t/2) = 6$ (B) $0.2x + 0.3y = 1.3; 0.4x + 0.5y = 2.3$ (C) $(3x/2) – (5y/3) = -2; (x/3) + (y/2) = (13/6)$
7. Solve $2x + 3y = 11$ and $2x – 4y = – 24$ and hence find the value of 'm' for which $y = mx + 3$.
8. The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save ` 2000 per month, find their monthly incomes.
9. The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?

10. Solve the following pair of linear equations by the elimination method and the substitution method :

(A) $3x + 4y = 10$ and $2x – 2y = 2$

(B) $3x – 5y – 4 = 0$ and $9x = 2y + 7$

(C) x/2+ 2y/3 = -1 and x-y/3 = 3

CHAPTER- 4 QUADRATIC EQUATION

1. Check whether the following are quadratic equations: (A) x (2x + 3) = x^2+1+ 1

(B) ?(x+2)?^3= x^3- 4

2. Check whether the following are quadratic equations:

(A) x^2 - 2x = (-2) (3 - x) (B) (x - 2)(x + 1) = (x - 1)(x + 3)

(C)?(x+2)?^3 = 2x (x^2 - 1) (D) x^3 - 4x^2 - x + 1 = ?(x-2)?^3

3. Represent the following situations in the form of quadratic equations:

(A) The product of two consecutive positive integers is 306. We need to find the integers.

(B) A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less then it would have taken

4. Find the roots of the quadratic equation ?6x?^2- x - 2 = 0.

5. Find the roots of the following quadratic equations by factorisation:

(A) ?2x?^2 + x - 6 = 0 (B) ?2 x^2 + 7x + 5?2 = 0 (C) ?2x?^2 - x +1/8 = 0

6. Find two numbers whose sum is 27 and product is 182.

7. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides. A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If the total cost of production on that day was Rs 90, find the number of articles produced and the cost of each article.

(A) ?3x?^2 - 5x + 2 = 0 (B) x^2+ 4x + 5

8. Find the roots of the following quadratic equations, if they exist, using the quadratic formula:

9. Find the roots of the following equations:

(I) x+1/x=0,x?0 (ii) 1/x-1/(x-2)=3,x?0,2

10. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

11. Find the roots of the following equations:

(I) x-1/x = 3, x ? 0 (ii) 1/x+4 - 1/x-7 = 11/30, x ? -4, 7

12. The diagonal of a rectangular field is 60 metres more than the shorter side. If the longer side is 30 metres more than the shorter side, find the sides of the field.

13. The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

14. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

15. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Is it possible to do so? If yes, at what distances from the two gates should the pole be erected?

16. Find the nature of the roots of the following quadratic equations. If the real roots exist, find them; (A) ?2x?^2 - 3x + 5 = 0 (B) ?3x?^2- 4?3x + 4 = 0

17. Find the values of k for each of the following quadratic equations, so that they have two equal roots. (I) ?2x?^2 + 1kx + 3 = 0 (ii) kx (x - 2) + 6 = 0

18. Is the following situation possible? If so, determine their present ages. The sum of the ages of two friends is 20 years. Four years ago, the product of their ages in years was 48.

CHAPTER- 5 ARITHMETIC PROGRESSION

1. In which of the following situations, does the list of numbers involved make as arithmetic progression and why? (A) The cost of digging a well after every metre of digging, when it costs Rs 150 for the first metre and rises by Rs 50 for each subsequent metre. (B) The amount of money in the account every year, when Rs 10000 is deposited at compound interest at 8% per annum.

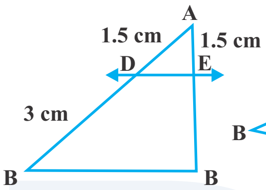
2. Write first four terms of the A.P. when the first term a and the common difference are given as follows:(A) a = 4, d = – 3 (B) a = -1 d = ½ (C) a = – 1.25, d = – 0.25

3. Which term of the AP : 21, 18, 15, . . . is – 81? Also, is any term 0? Give reason for your answer.

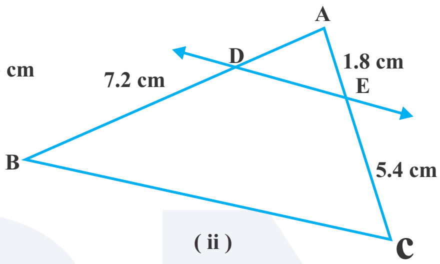
4. Determine the AP whose 3rd term is 5 and the 7th term is 9.
5. How many two-digit numbers are divisible by 3?
6. Find the 11th term from the last term (towards the first term) of the AP : 10, 7, 4, . . ., – 62.
7. Check whether – 150 is a term of the AP : 11, 8, 5, 2 . . .
8. Find the 31st term of an AP whose 11th term is 38 and the 16th term is 73.
9. If the 3rd and the 9th terms of an AP are 4 and – 8 respectively, which term of this AP is zero?
10. The 17th term of an AP exceeds its 10th term by 7. Find the common difference.
11. Two APs have the same common difference. The difference between their 100th terms is 100, what is the difference between their 1000th terms?
12. How many multiples of 4 lie between 10 and 250?
13. Find the sum of the first 22 terms of the AP : 8, 3, –2, . . .
14. Find the sum of : (i) the first 1000 positive integers (ii) the first n positive integers
15. Find the sum of the following APs. (iii) 0.6, 1.7, 2.8 ,…….., to 100 terms (iv) 1/15, 1/12, 1/10, …… , to 11 terms
16. Given a = 7, a13 = 35, find d and S13.
17. Given d = 5, S9 = 75, find a and a9.
18. Given a = 2, d = 8, Sn = 90, find n and an.
19. Given an = 4, d = 2, Sn = − 14, find n and a.
20. Given a = 3, n = 8, S = 192, find d.
21. The first term of an AP is 5, the last term is 45 and the sum is 400. Find the number of terms and the common difference.
22. Find the sum of first 22 terms of an AP in which d = 7 and 22nd term is 149.
23. Find the sum of first 51 terms of an AP whose second and third terms are 14 and 18 respectively.
24. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms
25. Show that a1, a2 … , an , … form an AP where an is defined as below (i) an = 3+4n (ii) an = 9−5n Also find the sum of the first 15 terms in each case.

CHAPTER- 6 TRIANGLES

1. Fill in the blanks using the correct word given in brackets : (i) All circles are . (congruent, similar) (ii) All squares are . (similar, congruent) (iii) All triangles are similar. (isosceles, equilateral) (iv) Two polygons of the same number of sides are similar, if (a) their corresponding angles are and (b) their corresponding sides are . (equal, proportional)
2. E and F are points on the sides PQ and PR respectively of a ΔPQR. For each of the following cases, state whether EF || QR. (i) PE = 3.9 cm, EQ = 3 cm, PF = 3.6 cm and FR = 2.4 cm (ii) PE = 4 cm, QE = 4.5 cm, PF = 8 cm and RF = 9 cm (iii) PQ = 1.28 . cm, PR = 2.56 cm, PE = 0.18 cm and PF = 0.63 cm
3. In figure. (i) and (ii), DE || BC. Find EC in (i) and AD in (ii).



(i)



(ii)

4. Let ΔABC ~ ΔDEF and their areas be, respectively, 64 cm2 and 121 cm2 . If EF = 15.4 cm, find BC.
5. A ladder is placed against a wall such that its foot is at a distance of 2.5 m from the wall and its top reaches a window 6 m above the ground. Find the length of the ladder.

CHAPTER 7 CO-ORDINATE GEOMETRY

1. Determine if the points (1, 5), (2, 3) and (-2, -11) are collinear.
2. Check whether (5, – 2), (6, 4) and (7, – 2) are the vertices of an isosceles triangle.
3. Find the point on the x-axis which is equidistant from (2, – 5) and (- 2, 9).
4. In what ratio does the point (– 4, 6) divide the line segment joining the points A(– 6, 10) and B(3, – 8)?
5. Find the coordinates of the points of trisection (i.e., points dividing in three equal parts) of the line segment joining the points A(2, – 2) and B(– 7, 4).
6. Find the ratio in which the line segment joining the points (-3, 10) and (6, – 8) is divided by (-1, 6).

7. If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, find x and y.
8. If A and B are (-2, -2) and (2, -4), respectively, find the coordinates of P such that AP = 3/7 AB and P lies on the line segment AB.
9. Find the coordinates of the points which divide the line segment joining A (- 2, 2) and B (2, 8) into four equal parts.
10. Find the area of a rhombus if its vertices are (3, 0), (4, 5), (-1, 4) and (-2,-1) taken in order.

CHAPTER - 8 TRIGONOMETRY

1. Given tan A =4/3, find the other trigonometric ratios of the angle A.
2. Consider Δ ACB, right-angled at C, in which AB = 29 units, BC = 21 units and ∠ ABC = θ. Determine the values of
3. In a right triangle ABC, right-angled at B, if tan A = 1, then verify that 2 sin A cos A = 1.
4. In Δ OPQ, right-angled at P, OP = 7 cm and OQ – PQ = 1 cm. Determine the values of sin Q and cos Q.
5. If sin A = ¾ calculate cos A and tan A.
6. Given 15 cot A = 8, find sin A and sec A.
7. Given sec θ = 13/12 calculate all other trigonometric ratios.
8. If 3 cot A = 4, check whether $(1-\tan^2 A)/(1+\tan^2 A) = \cos^2 A - \sin^2 A$ or not.
9. In Δ PQR, right-angled at Q, PQ = 3 cm and PR = 6 cm. Determine ∠ QPR and ∠ PRQ.
10. If sin (A – B) =1/2, cos (A + B) = ½ 0° < A + B ≤ 90°, A > B, find A and B.
11. $\dfrac{\cos 45^\circ}{\sec 30^\circ + \operatorname{cosec} 30^\circ}$ 12. $\dfrac{\sin 30^\circ + \tan 45^\circ - \operatorname{cosec} 60^\circ}{\sec 30^\circ + \cos 60^\circ + \cot 45^\circ}$ 13. $\dfrac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$
12. If tan 2A = cot (A – 18°), where 2A is an acute angle, find the value of A.
13. If sec 4A = cosec (A – 20°), where 4A is an acute angle, find the value of A.

CHAPTER- 9 APPLICATION OF TRIGONOMETRY

1. An electrician has to repair an electric fault on a pole of height 5 m. She needs to reach a point 1.3m below the top of the pole to undertake the repair work. What should be the length of the ladder that she should use which, when inclined at an angle of 60° to the horizontal, would enable her to reach the required position? Also, how far from the foot of the pole should she place the foot of the ladder? (You may take √3 = 1.73)
2. An observer 1.5 m tall is 28.5 m away from a chimney. The angle of elevation of the top of the chimney from her eyes is 45°. What is the height of the chimney?

3. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle 30° with it. The distance between the foot of the tree to the point where the top touches the ground is 8 m. Find the height of the tree.
4. A contractor plans to install two slides for the children to play in a park. For the children below the age of 5 years, she prefers to have a slide whose top is at a height of 1.5 m, and is inclined at an angle of 30° to the ground, whereas for elder children, she wants to have a steep slide at a height of 3m, and inclined at an angle of 60° to the ground. What should be the length of the slide in each case?
5. The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower, is 30°. Find the height of the tower.
6. A kite is flying at a height of 60 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60°. Find the length of the string, assuming that there is no slack in the string.

CHAPTER- 10 CIRCLES

1. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Length PQ is : (A) 12 cm (B) 13 cm © 8.5 cm (D) ?119 cm

2. Fill in the blanks:

(i) A tangent to a circle intersects it in ________ point(s).

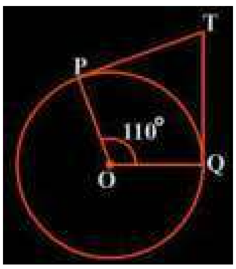
(ii) A line intersecting a circle in two points is called a __________ .

(iii) A circle can have__________ parallel tangents at the most.

(iv) The common point of a tangent to a circle and the circle is called __________ .

3. In Fig. 10.11, if TP and TQ are the two tangents to a circle with center O so that ?POQ = 110°, then ?PTQ is equal to (A) 60° (B) 70° (C) 80° (D) 90°

4. If tangents PA and PB from a point P to a circle with Centre O are inclined to each other at angle of 80°, then ? POA is equal to (A) 50° (B) 60° (C) 70° (D) 80°



5. The length of a tangent from a point A at distance 5 cm from the Centre of the circle is 4 cm. Find the radius of the circle.

6. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

CHAPTER- 11 CONSTRUCTIONS

ALL CONSTRUCTION

CHAPTER- 12 AREA RELATED TO CIRCLES

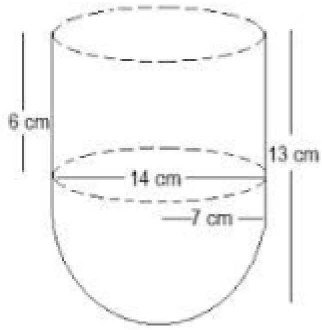
1. The radii of two circles are 19 cm and 9 cm respectively. Find the radius of the circle which has a circumference equal to the sum of the circumferences of the two circles.
2. The radii of two circles are 8 cm and 6 cm, respectively. Find the radius of the circle having area equal to the sum of the areas of the two circles.
3. Find the area of the sector of a circle with radius 4 cm and of angle 30°. Also, find the area of the corresponding major sector (Use $\pi = 3.14$).
4. Find the area of a quadrant of a circle whose circumference is 22 cm.
5. A chord of a circle of radius 10 cm subtends a right angle at the center. Find the area of the corresponding: (i) minor segment (ii) major sector. (Use $\pi = 3.14$)
6. In a circle of radius 21 cm, 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) area of the segment formed by the corresponding chord
7. A chord of a circle of radius 15 cm subtends an angle of 60° at the Centre. Find the areas of the corresponding minor and major segments of the circle. (Use $\pi = 3.14$ and $\sqrt{3} = 1.73$).

CHAPTER -13 SURFACE AREA AND VOLUMES

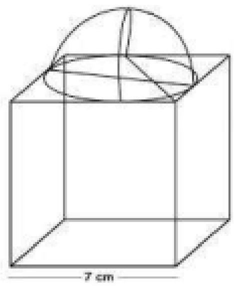
1. Rasheed got a playing top (lotto) as his birthday present, which surprisingly had no colour on it. He wanted to colour it with his crayons. The top is shaped like a cone surmounted by a hemisphere. The entire top is 5 cm in height and the diameter of the top is 3.5 cm. Find the area he has to colour.
2. The decorative block shown is made of two solids — a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block.
3. Mayank made a bird-bath for his garden in the shape of a cylinder with a hemispherical depression at one end. The height of the cylinder is 1.45 m and its radius is 30 cm. Find the

total surface area of the bird-bath.

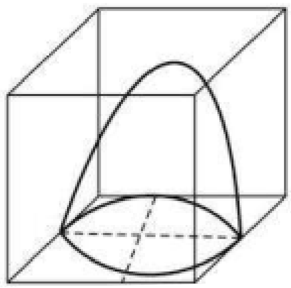
4. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.



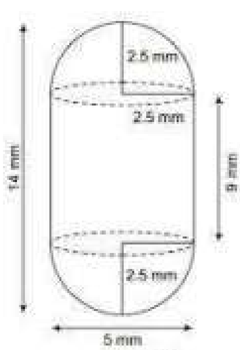
5. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.



6. A hemispherical depression is cut out from one face of a cubical wooden block such that the diameter l of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.



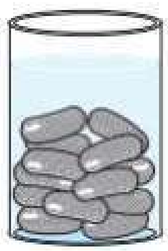
7. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.



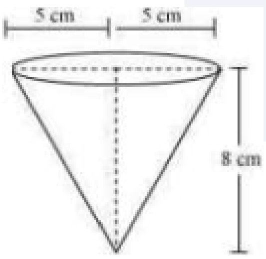
8. A juice seller was serving his customers using glasses. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm, find the apparent capacity of the glass and its actual capacity. (Use $\pi = 3.14$.)

9. Rachel, an engineering student, was asked to make a model shaped like a cylinder with two cones attached at its two ends by using a thin aluminum sheet. The diameter of the model is 3 cm and its length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model that Rachel made. (Assume the outer and inner dimensions of the model to be nearly the same.)

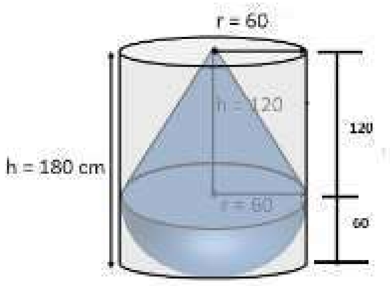
10. A Gulab jamun contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 Gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm (see . figure).



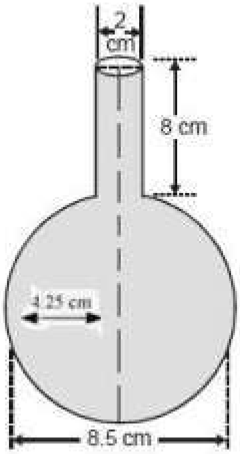
11. A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.



12. A solid consisting of a right circular cone of height 120 cm and radius 60 cm standing on a hemisphere of radius 60 cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm.



13. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter; the diameter of the spherical part is 8.5 cm. By measuring the amount of water it holds, a child finds its volume to be 345 cm3 . Check whether she is correct, taking the above as the inside measurements, and π = 3.14.



CHAPTER -14 STATISTICS

1. Consider the following distribution of daily wages of 50 workers of a factory.

Daily wages (in Rs.)	100-120	120-140	140-160	160-180	180-200
Number of workers	12	14	8	6	10

Find the mean daily wages of the workers of the factory by using an appropriate method.

2. The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is Rs 18. Find the missing frequency f.

Daily Pocket Allowance(in c)	11-13	13-15	15-17	17-19	19-21	21-23	23-35
Number of children	7	6	9	13	f	5	4

3. In a retail market, fruit vendors were selling mangoes kept in packing boxes. These boxes contained varying number of mangoes. The following was the distribution of mangoes according to the number of boxes.

Number of mangoes	50-52	53-55	56-58	59-61	62-64
Number of boxes	15	110	135	115	25

Find the mean number of mangoes kept in a packing box. Which method of finding the mean did you choose?

4. The table below shows the daily expenditure on food of 25 households in a locality. Find the mean daily expenditure on food by a suitable method.

Daily expenditure(in c)	100-150	150-200	200-250	250-300	300-350
Number of households	4	5	12	2	2

5. The following data gives the information on the observed lifetimes (in hours) of 225 electrical components:

Lifetime (in hours)	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	10	35	52	61	38	29

Determine the modal lifetimes of the components.

6. The following data gives the distribution of total monthly household expenditure of 200 families of a village. Find the modal monthly expenditure of the families. Also, find the mean monthly expenditure:

Expenditure	**Number of families**
1000-1500	24
1500-2000	40
2000-2500	33
2500-3000	28
3000-3500	30
3500-4000	22
4000-4500	16
4500-5000	7

7. A student noted the number of cars passing through a spot on a road for 100 periods each of 3 minutes and summarized it in the table given below. Find the mode of the data:

Number of cars	**Frequency**
0-10	7
10-20	14
20-30	13
30-40	12
40-50	20
50-60	11

60-70	15
70-80	8

8. The following frequency distribution gives the monthly consumption of an electricity of 68 consumers in a locality. Find the median, mean and mode of the data and compare them.

Monthly consumption(in units)	**No. of customers**
65-85	4
85-105	5
105-125	13
125-145	20
145-165	14
165-185	8
185-205	4

9. The Life insurance agent found the following data for the distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to the persons whose age is 18 years onwards but less than the 60 years.

Age (in years)	**Number of policy holder**
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98

Below 60	100

10. In this 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in English alphabets in the surnames was obtained as follows:

Number of letters	1-4	4-7	7-10	10-13	13-16	16-19
Number of surnames	6	30	40	16	4	4

Determine the number of median letters in the surnames. Find the number of mean letters in the surnames and also, find the size of modal in the surnames.

11. The distributions of below give a weight of 30 students of a class. Find the median weight of a student.

Weight(in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
Number of students	2	3	8	6	6	3	2

CHAPTER - 15 PROBABILITY

COMPLETE CHAPTER

NOTE: ***All Including Theorems And Construction Are Mandatory For Scoring.***

Only Theorems Number 1.7, 6.6 & 6.8

All The Best