MATHEMATICS

RATIONAL NUMBERS

CLASS: VIII

I. SECTION - A (ONE MARK)

1. What should be added to -5/4 to get -1?
2. What should be subtracted from -5/4 to get -1?
3. What is the multiplicative identity for rational numbers.
4. What is the additive inverse of 3/5?
5. Give a rational number which when added to it gives the same number.
6. By what rational number should 22/7 be divided, to get the number - 11/24?
7. If you subtract 1/8 from a number and multiply the result by 1/4, you get 1/16. What is the number?
8. Find two rational numbers between (i) -3 and 3. (ii) 0 and 1.
9. The product of a number and its reciprocal is _____.
10. _____ is the only rational number which is equal its additive inverse.
11. Find a rational number whose product with a given rational number is equal to the given rational number.
12. Find : $\frac{-3}{8} \times \frac{4}{-13}$
13. The product of two rational number is 2 , if one of the rational number is 1/7 ,what is the value of other?
14. Write five rational numbers which are smaller than 5.
15. The reciprocal of a negative rational number is _____.
16. There are _____ number of rational number between two rational number.
17. If x be any rational number then $x + 0$ is equal to-------
18. If y be the reciprocal of rational number x, then the reciprocal x of will be -------
19. Zero has _____ reciprocal.
20. $-(-x)$ is same as --------

II. SECTION - B (TWO MARKS)

21. If y be the reciprocal of x, then the reciprocal of y^2 in terms of x will be ?
22. The reciprocal of $\frac{3}{4} \times \frac{-5}{21}$
23. The two rational numbers lying between –2 and –5 with denominator as 1 are ---------
24. Find the multiplicative inverse of $5\frac{3}{4}$
25. Find five rational numbers between 0 and -1
26. Find the sum of additive inverse and multiplicative inverse of 7.
27. Find the product of additive inverse and multiplicative inverse of -3 .
28. What should be subtracted from 5/8 to make it -1?
29. Represent 3/4 and 8/9 on a number line.
30. Write 2/3, -4/9, -8/11 in ascending order.
31. The negative of a negative rational number is always a _____ rational number.
32. Rational numbers can be added or multiplied with any _____.

State whether the statements are true (T) or false (F).

33. For every rational number x, $x \times 0 = x$.
34. For every rational numbers x, y and z, $x + (y \times z) = (x + y) \times (x + z)$.
35. For all rational numbers a, b and c, $a(b + c) = ab + bc$.
36. 1 is the only number which is its own reciprocal.
37. –1 is not the reciprocal of any rational number.
38. For any rational number x, $x + (–1) = –x$.
39. For rational numbers x and y, if $x<y$ then $x – y$ is a positive rational number.
40. If x and y are negative rational numbers, then so is $x + y$.

III. SECTION - C (FOUR MARKS)

41. Find a) $2 \div \frac{4}{5}$ b) $\frac{5}{3} \times \frac{-3}{20} \times \frac{21}{4}$
42. Write the following rational numbers in the descending order.

    $\frac{8}{7}, \frac{-9}{8}, \frac{-3}{2}, 0, \frac{2}{5}$
43. If 16 shirts of equal size can be made out of 24m of cloth, how much cloth is needed for making one shirt?
44. $\frac{7}{11}$ of all the money in Hamid's bank account is Rs. 77,000. How much money does Hamid have in his bank account?
45. The cost of $\frac{19}{4}$metres of wire is Rs.$\frac{171}{2}$. Find the cost of one metre of the wire.
46. $5\frac{1}{2}$ metres long rope is cut into 12 equal pieces. What is the length of each piece?
47. Write a rational number equivalent to 9/10 having 90 as numerator.
48. Find five rational numbers between$\frac{2}{5}$ and $\frac{1}{4}$
49. Find five rational numbers between $-\frac{2}{3}$ and $\frac{2}{3}$
50. A mother and her two daughters got a room constructed for Rs. 62,000. The elder daughter contributes $\frac{3}{8}$ of her mother's contribution while the younger daughter contributes $\frac{1}{2}$ of her mother's share, How much do the three contribute individually?

LINEAR EQUATION IN ONE VARIABLE

I. SECTION - A (ONE MARK)

1. How old will I be after 10 years, if my age before 10 years was 'x' years?
2. If x is an even number, which is the next odd number?
3. If the difference of two consecutive number is 15 and greater of them is x then the smaller number is:-------
4. Two year ago my age was x years, then what was my age 5 years ago?
5. If the sum of two consecutive numbers is 71 and one number is x, then the other number is----
6. If 2x/5 = 4, the value of x is-----
7. If 7x+15 = 50, the value of x is-----

8. If x/3 + 1 = 7/15,the value of x is-----
9. What do we get when we transpose 5/2 to RHS in the equation x/4 + 5/2 = -3/3?
10. If $8x - 3 = 25 + 17x$, the value of x is-----
11. Any value of the variable which makes both sides of an equation equal is known as a _____ of the equation.
12. 9x+8=50 find x.
13. Three consecutive numbers whose sum is 12 find that three nos.
14. The share of A when Rs 25 are divided between A and B so that A gets Rs. 8 more than B is _____.
15. On subtracting 8 from *x*, the result is 2. The value of *x* is _____.
16. When a number is divided by 8, the result is –3. The number is _____.
17. 9 is subtracted from the product of *p* and 4, the result is 11. The value of *p* is _____.
18. After 18 years, Swarna will be 4 times as old as he is now. His present age is_____.
19. Convert the statement Adding 15 to 4 times *x* is 39 into an equation-------

II. SECTION - B (TWO MARKS)

20. The sum of two consecutive even numbers is 60. Find the numbers.
21. Solve: y/2 - 1/2 = y/3 + 1/4
22. Solve **:** (0.5y - 9)/0.25 = 4y – 3
23. Solve: 15(x - y) - 3(x - 9) + 5(x + 6) = 0
24. Solve:(3 - 7x)/(15 + 2x) = 0
25. Of the three angles of a triangle, the second one is twice the first and the third angle is thrice the first angle. Find all the three angles of the triangle.
26. Divide 40 into two parts such that 1/4th of one part is 3/8th of the other.
27. A number is such that it is as much greater than 45 as it is less than 75. Find the number.
28. A is twice old as B. Five years ago A was 3 times as old as B. Find their present ages.
29. The digits of a 2-digit number differ by 5. If the digits are interchanged and the resulting number is added to the original number, we get99. Find the original number.
30. Solve : (x + 3)/6 + 1 = (6x – 1)/3
31. Solve x/3 + 1/5 = x/2 – ¼
32. Solve : 5x – 3 = 3x + 7
33. If the sum of two numbers is 30 and their ratio is 2:3 then find the numbers.
34. The numerator of a fraction is 2 less than the denominator. If one is added to its denominator, it becomes 1/2 find the fraction.
35. Perimeter of a rectangle is 13cm. if its width is 11/4 cm, find its length.
36. What should be subtracted from thrice the rational number -8/3 to get 5/2?
37. The sum of three consecutive multiples of 7 is 63. Find these multiples.

III. SECTION - C (FOUR MARKS)

38. The digits of a two-digit number differ by 3. If digits are interchanged and the resulting number is added to the original number, we get 121. Find the original number.
39. The present of Sita's father is three times the present age of Sita. After six years sum of their ages will be 69 years. Find their present ages.
40. The sum of three consecutive even natural numbers is 48. Find the greatest of these numbers.
41. The sum of three consecutive odd natural numbers is 69. Find the prime number out of these numbers.
42. Two equal sides of a triangle are each 4m less than three times the third side. Find the dimensions of the triangle, if its perimeter is 55m.
43. After 12 years, Kanwar shall be 3 times as old as he was 4 years ago. Find his present age.
44. Denominator of a number is 4 less than its numerator. If 6 is added to the numerator it becomes thrice the denominator. Find the fraction.
45. On dividing Rs. 200 between A and B such that twice of A's share is less than 3 times B's share by 200, B's share is?
46. Madhulika thought of a number, doubled it and added 20 to it. On dividing the resulting number by 25, she gets 4. What is the number?
47. Find p: $4(3p + 2) – 5(6p – 1) = 2(p – 8) – 6(7p – 4)$

UNDERSTANDING QUADRILATERALS

I. SECTION - A (ONE MARK)

1. Which of the following quadrilaterals has two pairs of adjacent sides equal and diagonals intersecting at right angles?
   (i) square (ii) rhombus (iii) kite (iv) rectangle.
2. Which of the following quadrilaterals has a pair of opposite sides parallel?
   (i) rhombus (ii) trapezium (iii) kite (iv) rectangle.
3. Which of the following quadrilaterals is a regular quadrilateral?
   (i) rectangle (ii) square (iii) rhombus (iv) kite.
4. Which of the quadrilaterals has all angles as right angles, opposite sides equal and diagonals bisect-each other?
   (i) rectangle (ii) rhombus (iii) square (iv) none of these.
5. Which of the parallelograms has all sides equal and diagonals bisect each other at right angle?
   (i) square (ii) rectangle (iii) rhombus (iv) trapezium.
6. In an isosceles parallelogram, we have:
   (i) pair of parallel sides as equal (ii) pair of non-parallel sides as equal
   (iii) pair of non-parallel sides as perpendicular (iv) none of these.
7. Which of the following is true for the adjacent angles of a parallelogram?
   (i) they are equal to each other (ii) they are complementary angles
   (iii) they are supplementary angles (iv) none of these.
8. The sides of a pentagon are produced in order. Which of the following is the sum of its exterior angles?
   (i) 540° (ii) 180° (iii) 720° (iv) none of these
9. To find the sum of interior angles of a quadrilaterals of n-sides ---------
10. Diagonals of which of the following quadrilaterals do not bisect it into two congruent triangles?
    (i) rhombus (ii) trapezium (iii) square (iv) rectangle.

11. Two adjacent angles of a parallelogram are in the ratio 1:5. Then all the angles of the parallelogram are

(a) 30°, 150°, 30°, 150° (b) 85°, 95°, 85°, 95°

(c) 45°, 135°, 45°, 135° (d) 30°, 180°, 30°, 180°

12. A parallelogram PQRS is constructed with sides QR = 6 cm, PQ = 4 cm and ∠PQR = 90°. Then PQRS is a

(a) square (b) rectangle (c) rhombus (d) trapezium

13. The angles P, Q, R and S of a quadrilateral are in the ratio 1:3:7:9. Then PQRS is a

(a) parallelogram (b) trapezium with PQ || RS

(c) trapezium with QR||PS (d) kite

14. PQRS is a trapezium in which PQ||SR and ∠P=130°, ∠Q=110°. Then ∠R is equal to:
(a) 70° (b) 50° (c) 65° (d) none of these.
15. The number of sides of a regular polygon whose each interior angle is of 135° is
(a) 9 (b) 7 (c) 8 (d) none of these.
16. If a diagonal of a quadrilateral bisects both the angles, then it is a

(a) kite (b) parallelogram

(c) rhombus (d) rectangle

17. To construct a unique parallelogram, the minimum number of measurements required is

(a) 2 (b) 3 (c) 4 (d) 5

18. To construct a unique rectangle, the minimum number of measurements required is

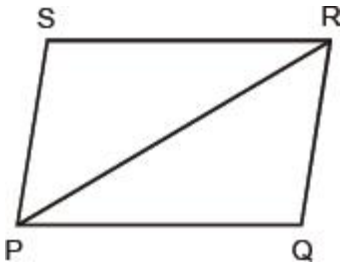
(a) 4 (b) 3 (c) 2 (d) 1

19. In a parallelogram , the pairs of opposite sides are _____.

20. In a parallelogram , the pairs of adjacent angles are _____.

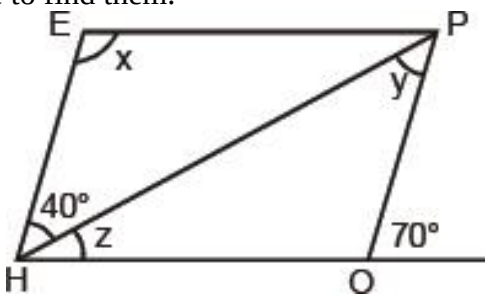
II. SECTION - B (THREE MARKS)

21. One angle of a parallelogram is of measure 70°. Find the measures of the remaining angles of the parallelogram.
22. In the given figure PR is a diagonal of the parallelogram PQRS.
(i) Is PS = RQ? Why? (ii) Is SR = PQ? Why? (iii) Is PR = RP? Why?
(iv) Is ΔPSR ≅ ΔRQP? Why?



23. The perimeter of a parallelogram is 150 cm. One of its side is greater than the other by 25 cm. Find length of all sides of the parallelogram.

24. Lengths of adjacent sides of a parallelogram is 3 cm and 4 cm. Find its perimeter.
25. In a parallelogram, the ratio of the adjacent sides is 4 : 5 and its perimeter is 72 cm then, find the sides of the parallelogram.
26. The adjacent figure HOPE is a parallelogram. Find the angle measure x, y and z.
State the properties you use to find them.



27. Is ABCD a parallelogram if so find value of x and y .If ABCD is not a parallelogram justify it.

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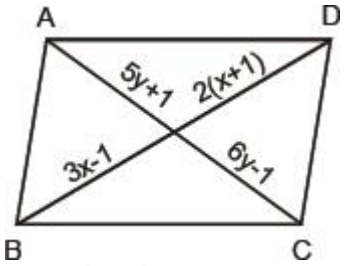
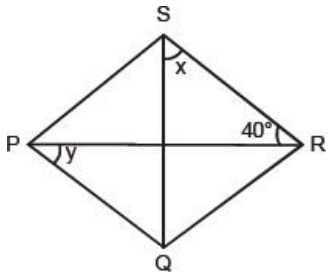
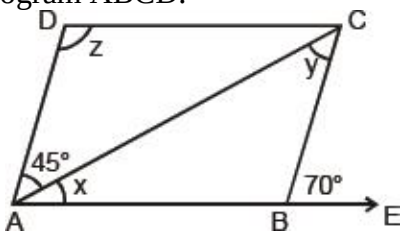


28. Find value of x and y where PQRS is a rhombus.



29. Find x, y, z in the given parallelogram ABCD.



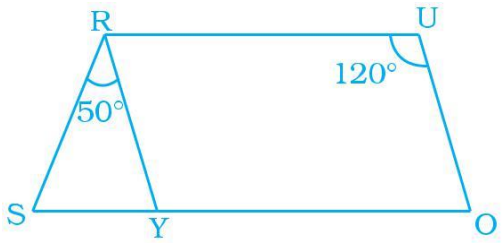
30. State whether True or False.
(a) All rectangles are squares.
(b) All rhombuses are parallelograms.
(c) All square are rhombuses and also rectangles.
(d) All squares are not parallelograms.
31. State whether True or False.
(e) All kites are rhombuses.
(f) All rhombuses are kites.
(g) All parallelograms are trapeziums.
(h) All squares are trapeziums.
32. PQRS is a parallelogram such that m∠R = 110°, then find m∠P and ∠S.
33. Two opposite angles of a parallelogram are (5x – 8)° and (2x + 82)°. Find the measures of each angle of the parallelogram.

34. The exterior angle of a regular polygon is one-fifth of its interior angle. How many sides the polygon has?
35. In a quadrilateral ABCD, DO and CO are the bisectors of ∠D and ∠C respectively. Prove that

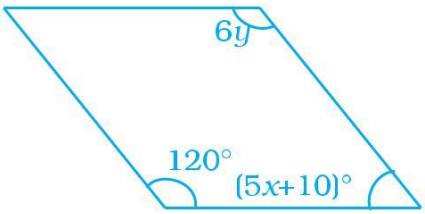
$$\angle COD = \frac{1}{2}(\angle A + \angle B)$$

III. SECTION - C (FOUR MARKS)

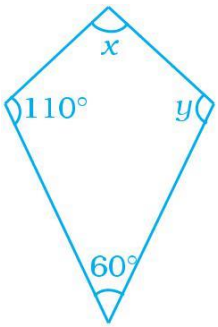
36. The diagonals of a rhombus are 8 cm and 15 cm. Find its side.
37. Two adjacent angles of a parallelogram are in the ratio 1:3. Find its angles.
38. In the given parallelogram YOUR, ∠RUO = 120° and OY is extended to point S such that ∠SRY = 50°. Find ∠YSR.



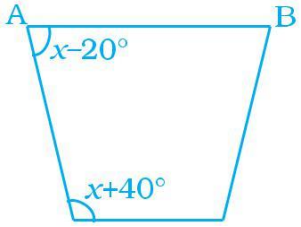
39. In parallelogram MODE, the bisector of ∠M and ∠O meet at Q, find the measure of ∠MQO.
40. Quadrilateral EFGH is a rectangle in which J is the point of intersection of the diagonals. Find the value of x if JF = $8x$ + 4 and EG = $24x$ – 8.
41. Find the values of x and y in the following parallelogram.



42. Find the values of x and y in the following kite.

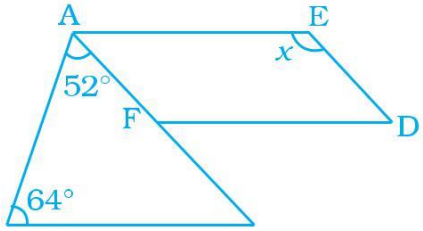


43. Find the value of x in the trapezium ABCD given below.

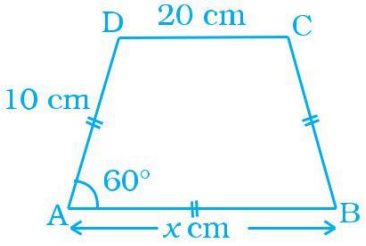


44. Two angles of a quadrilateral a e each of measure 75° and the other two angles are equal. What is the measure of these two angles? Name the possible figures so formed.

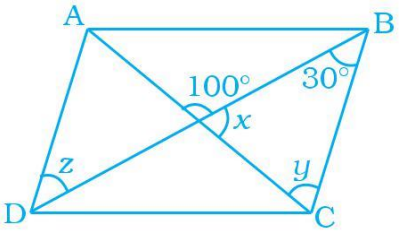
45. In a quadrilateral PQRS, ∠P = 50°, ∠Q = 50°, ∠R = 60°. Find ∠S. Is this quadrilateral convex or concave?
46. Both the pairs of opposite angles of a quadrilateral are equal and supplementary. Find the measure of each angle.
47. Find the measure of each angle of a regular octagon.
48. In the following figure, FD||BC||AE and AC||ED. Find the value of *x*.



49. In the following figure, AB||DC and AD = BC. Find the value of *x*.



50. ABCD is a parallelogram. Find the value of *x*, *y* and *z*.



PRACTICAL GEOMETRY

I. SECTION - A (FOUR MARKS)

1. Construct a rhombus whose diagonals are 4.5cm and 6.2 cm.
2. Draw a rectangle whose adjacent sides are 2.8 cm and 4.8 cm.
3. Draw a rectangle whose adjacent sides are 3 cm and 5 cm.
4. Construct a quadrilateral ABCD, where AB= 4.3 cm, BC= 5.2 cm, CD= 6.5 cm, ∟B= 105° and ∟C= 60°.
5. Construct a quadrilateral PQRS where, PQ= 5.4 cm, ∟P= 60°, ∟Q= 105°, ∟R=75° and ∟S= 120°
6. Construct a quadrilateral ABCD in which AB= 5 cm, BC= 6.5 cm, angle A= 75°, angle B= 105° and angle C= 120°.
7. Draw a line segment of length 10 cm and divide it into 4 equal parts.

8. Construct a quadrilateral WXYZ when WX= 3.3 cm, XY= 4cm, YZ= 4.1 cm, WZ= 3.6 cm and XZ= 5.5 cm.
9. Construct a rhombus whose diagonals are 6.2 cm and 8.4 cm.
10. Construct a quadrilateral BEST, given ES= 4.5cm, BT= 5.5 cm, ST= 5 cm, the diagonal BS= 5.5 cm and diagonal ET= 7 cm. Find Angle E, Angle T and RE.
11. Construct a parallelogram BEAT, BE=5 cm, EA= 6cm and Angle R= 85°.
12. Construct a trapezium ABCD in which AB||DC, ∠A = 105°, AD = 3 cm, AB = 4 cm and CD = 8 cm.
13. Construct a parallelogram ABCD in which AB = 4 cm, BC = 5 cm and ∠B = 60°.
14. Construct a rhombus whose side is 5 cm and one angle is of 60°.
15. Construct a rectangle whose one side is 3 cm and a diagonal equal to 5 cm.
16. Construct a square of side 4 cm.
17. Construct a rhombus CLUE in which CL = 7.5 cm and LE = 6 cm.
18. Construct a quadrilateral BEAR in which BE = 6 cm, EA = 7 cm, RB = RE = 5 cm and BA = 9 cm. Measure its fourth side.
19. Construct a parallelogram POUR in which, PO=5.5 cm, OU = 7.2 cm and ∠O = 70°.
20. Draw a circle of radius 3 cm and draw its diameter and label it as AC. Construct its perpendicular bisector and let it intersect the circle at B and D. What type of quadrilateral is ABCD? Justify your answer.
21. Construct a parallelogram HOME with HO = 6 cm, HE = 4 cm and OE = 3 cm.
22. Is it possible to construct a quadrilateral ABCD in which AB = 3 cm, BC = 4 cm, CD =4 cm, DA = 5.9 cm and diagonal AC = 8 cm? If not, why?
23. Is it possible to construct a quadrilateral ROAM in which RO=4 m, OA = 5 cm, ∠O = 120°, ∠R = 105° and ∠A = 135°? If not, why?
24. Construct a square in which each diagonal is 5cm long
25. Construct a quadrilateral NEWS in which NE = 7cm, EW = 6 cm, ∠N =60°, ∠E =110° and ∠S = 85°.
26. Construct a parallelogram when one of its side is 4cm and its two diagonals are 5.6 cm and 7cm. Measure their side.
27. Find the measure of each angle of a regular polygon of 20 sides?
28. ABCD is a rhombus such that the perpendicular bisector of AB passes through D. Find the angles of the rhombus. [Hint: Join BD. Then ABD is equilateral.]
29. ABCD is a parallelogram. Points P and Q are taken on the sides AB and AD respectively and the parallelogram PRQA is formed. If ∠C = 45°, find ∠R.
30. Three angles of a quadrilateral are equal. Fourth angle is of measure 120°. What is the measure of equal angles?

DATA HANDLING

I. SECTION - A (ONE MARKS)

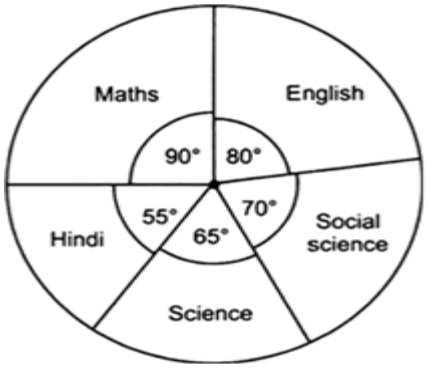
1. The range of the data: 6,14,20,16,6,5,4,18,25,15, and 5 is
   - I. 4
   - II. 21
   - III. 25
   - IV. 20
2. The class mark of the class 20-30 is
   - I. 20
   - II. 30
   - III. 25
   - IV. 10

3. The difference between the highest and the lowest value of the observations in a data is called:
    I. Mean
    II. Range
    III. Total frequency
    IV. Sum of observation
4. In the interval 35-45, 45 is called
    I. Upper limit
    II. Lower limit
    III. Range
    IV. Frequency
5. The number of times a particular observation occurs in a given data is called:
    I. Its frequency
    II. Its range
    III. Its mode.
    IV. None of these
6. Is history which of the following is represented by the heights of the rectangles?
    I. Frequency
    II. Class interval
    III. Class size
    IV. Range
7. Tally marks are used to find which of the following?
    I. Frequency
    II. Lower limits
    III. Upper limits
    IV. Class marks
8. Which of the following is the probability of an impossible event?
    I. 0
    II. 1
    III. 2
    IV. None of these
9. Which of the following is the probability of a sure event?
    I. 0
    II. 1
    III. 2
    IV. None of these
10. A coin is tossed. Which of the following is the probability of getting a head or tail?
    I. 0
    II. 1
    III. 1/2
    IV. None of these

II. SECTION - B (THREE MARKS)

11. The marks scored by 20 students in a test are given below:
84, 57, 53, 89, 41, 57, 47, 64, 58, 44, 53, 72, 51, 78, 71, 62, 56, 68, 54, 42
Complete frequency table.
(i) What is the upper limit of 40–50?
(ii) What is the upper limit of 70–80?
(iii) What is the class size?

12. The following pie-chart represents the marks scored by a students. If he obtained 540 as total marks, answer the following questions:



(i) In which subject did the student score 120 marks?
(ii) What is the difference in the marks obtained in Maths and English?
(iii) In which subject did he get minimum marks?

13. Number of workshops organized by a school in different areas during the last six years are as :

Years	Number of workers
1992–93	30
1993–94	25
1994–95	48
1995–96	50
1996–97	45
1997–98	20

Draw a histogram representing the data.

14. A die is thrown. What is the probability of getting:
    (i) an even number?
    (ii) an odd number?
    (iii) A number between 3 and 6?
15. What is the probability of a number selected from the numbers 1, 2, 3, ..., 20 such that it is a prime number?
16. A bag contains 3 blue and 2 red balls. A ball is drawn at random. What is the probability of drawing a red ball?

17. Draw a histogram for the daily earnings of 30 general stores given in the following:

Daily earnings (in Rs)	Number of general stores
1450–1500	4
1500–1550	10
1550–1600	9
1600–1650	18
1650–1700	5

III. SECTION - C (FOUR MARKS)

18. Numbers 1 to 10 are written on ten separate cards such that one number on one slip. These are mixed well and one slip is chosen from the box without looking into it. What is the probability of:
    (i) getting a card on which 7 is written?
    (ii) getting a card having two-digit number on it?
    (iii) getting a number less than 5?

(iv) getting a number more than 5?

19. When a die is thrown, list the outcomes of an event of getting:
    (i) A number less than 5.
    (ii) A composite number.
    (iii) A prime number.
    (iv) A number more than 3.

20. The number of students in hostel, speaking different languages is given below. Display the data by a pie chart.

Language	Hindi	English	Marathi	Tamil	Bengali	Total
Number of students	40	12	9	7	4	72

21. Look at the following circle graph and answer the questions given below:

(i) Find the fraction of the circle representing each of these given information.
(ii) What is the central angle corresponding to the activities "Play and Home work"?

22. Read the frequency distribution table given below andanswer the questions that follow:

23.

Class Interval	Frequency
25 – 35	1
35 – 45	5
45 – 55	5
55 – 65	4
65 – 75	0
75 – 85	8
85 – 95	2
Total	**25**

(i) Class interval which has the lowest frequency.

(ii) Class interval which has the highest frequency.

(iii) What is the class size of the intervals?

(iv) What is the upper limit of the fifth class?

(v) What is the lower limit of the last class?

24. The height of a rectangle in a histogram shows the

(a) Width of the class (b) Upper limit of the class

(c) Lower limit of the class (d) Frequency of the class

25. A geometric representation showing the relationship between a whole and its parts is

(a) Pie chart (b) Histogram (c) Bar graph (d) Pictograph

26. In a pie chart, the total angle at the centre of the circle is

(a) 180° (b) 360° (c) 270° (d) 90°

27. The range of the data 30, 61, 55, 56, 60, 20, 26, 46, 28, 56 is

(a) 26 (b) 30 (c) 41 (d) 61

28. Which of the following is not a random experiment?

(a) Tossing a coin (b) Rolling a dice

(c) Choosing a card from a deck f 52 cards

(d) Throwing a stone from a roof of a building

29. What is the probability of choosing a vowel from the alphabets?

30. In a school only, 3 out of 5 students can participate in a competition. What is the probability of the students who do not make it to the competition?

SQUARES AND SQUARE ROOTS

I. SECTION - A (ONE MARK)

1. Which of the following can be a perfect square?

(i) A number ending in 3 or 7 (ii) A number ending with odd number of zeros (iii) A number ending with even number of zeros (iv) A number ending in 2.

2.Find the square root of 81 ?

3. Which of the following is the number non-perfect square numbers' between the square of the numbers n and n + 1?

(i) n + 1 (ii) n (iii) 2n (iv) 2n + 1

4. Which of the following is the difference between the squares of two consecutive natural number is:

(i) sum of the two numbers (ii) difference of the numbers

(iii) twice the sum of the two numbers (iv) twice the difference between the two numbers.

5. Which of the following is the number of non-perfect square number between 172 and 182?

(i) 613 (ii) 35 (iii) 34 (iv) 70

6. Which of the following is the difference between the squares of 21 and 22?

(i) 21 (ii) 22 (iii) 42 (iv) 43

7. Which of the following is the number of zeros in the square of 900?

(i) 3 (ii) 4 (iii) 5 (iv) 2

8 How many natural numbers lie between 5^2 and 6^2?

(a) 9 (b) 10 (c) 11 (d) 12

9. Which of the following cannot be a perfect square?

(a) 841 (b) 529 (c) 198

10.The one's digit of the cube of 23 is -----

State whether the statements are true (T) or false (F).

11. The square of 86 will have 6 at the units place.
12. The sum of two perfect squares is a perfect square.
13. The product of two perfect squares is a perfect square.
14. There is no square number between 50 and 60.
15. The square root of 1521 is 31.
16. Each prime factor appears 2 times in its square.
17. The square of 2.8 is 78.4.
18. The square root of 0.9 is 0.3.
19. The square of every natural number is always greater than the number itself.
20. There are five perfect square number between 1 and 100.

II. SECTION - B (THREE MARKS)

21A perfect square number can never have the digits ... at the units place.

22.Find $\sqrt{5625}$ = -------

23. Find the value of $(23)^2$

24. Find the value $\sqrt{45} \times \sqrt{20}$

25.Write a Pythagorean triplet whose smaller member is 6.

26 What is the sum of first n odd natural numbers?

27 A number ending in an odd number of zeros is never a

28If m, n, p are natural numbers such that

$(m^2 + n^2) = p^2$, then (m, n, p) is called

29 Express 49 as the sum of seven odd numbers.

30Without adding, find the sum.

(1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17)

31 Find the value of $\sqrt{441}$

32Write the unit digit of square of 799.

33 Find the square root of 39204.

34The area of a square plot is 2304 m^2. Find the side of the square.

35Find the greatest four digit number which is a perfect square.

36Using prime factorization, find the square root of 7056.

37.Is 900 a perfect square? How?

38 Find a Pythagorean triplet corresponding to n=5.

39 How many numbers lie between the square of 16 and 17?

40.Find the square root of 6400.

41 Find the smallest square number divisible by each of the number 6,9 and 15.

.

III. SECTION - C (FOUR MARKS)

42.Find the square root of 144 by the method of repeated subtraction.

43.Using prime factorization, find the square root of 729

44. Find the smallest number by which 1800 must be multiplied so that it becomes a perfect square. Also find the square root of the perfect square so obtained.

45.Is 2352 a perfect square? if not, find the smallest number by which 2352 must be multiplied so that the product is a perfect square. Find the square root of new number.

46.The area of a square field is 8281 m2. Find the length of its side.

47.Find the square root of $4\frac{53}{169}$

48.Simplify:$\sqrt{81} + \sqrt{0.81} + \sqrt{0.0081} + \sqrt{100}$

49.1225 plants are to be planted in a garden in such a way that each row contains as many plants as the number of rows. Find the number of rows and the number of plants in each row.
50.Find the smallest number by which 3645 should be divided so as to get a perfect square. Also, find the square root of the number so obtained.
51.For each of the following numbers, find the smallest number by which we divide it so as to get a perfect square. Also find the square root of the square numbers so obtained.
52(a) 37845 (b) 2800 (c) 45056
53.The students of Class VIII of a school donated Rs 2401 for Prime Minister National Relief Fund. Each student donated as many rupees as the number of students in the Class. Find the number of students in the Class.
54.There are 500 children in a school. For a P.T. drill they have to stand in such a manner that the number of rows is equal to number of columns. How many children would be left out in this arrangement?
55.A school collected Rs 2304 as fees from its students. If each student paid as many paise as there were students in the school, how many students were there in the school?
56.2025 plants are to be planted in a garden in such a way that each row contains as many plants as the number of rows. Find the number of rows and the number of plants in each row.
57.10404 students are sitting in a lecture room in such a manner that there are as many students in a row as there are rows in a lecture room. How many students are there in each row of a lecture room?
58.Is 176 a perfect square? If not, find the smallest number by which it should be multiplied to get a perfect square.
59.Is 9720 a perfect cube? If not, find the smallest number by which it should be divided to get a perfect cube.
60.By what smallest number should 216 be divided so that the quotient is a perfect square. Also find the square root of the quotient.

CUBE AND CUBE ROOTS

I. SECTION - A (ONE MARK)

1. Which of the following is correct?

I. Cube of a negative number is always positive. II. Cube of a negative number is always negative.

III. Cube of a negative number may be positive or negative IV. All of the above

2. If the digit in one's place of a number is 2, then the last digit of its cube will be:
I. 2
II. 4
III. 6
IV. 8

3. If the digit in one's place of a number is 3, then the last digit of its cube will be:
I. 3
II. 6
III. 7
IV. 9

4. If the digit in one's place of a number is 6, then the last digit of its cube will be:
I. 6
II. 3
III. 2
IV. 8

5. The volume of a cubical box is 64 cm^3. Which of the following is its side?
I. 2 cm
II. 4 cm
III. 6 cm

IV. 8 cm

6. Which of the following is a perfect cube?

I. 10000
II. 243
III. 343
IV. 270000

7. If a number is doubled then which of the following is a correct statement?

I. Its cube is two times the cube of the given number.
II. Its cube is three times the cube of the given number.
III. Its cube is six times the cube of the given number.
IV. Its cube is eight times the cube of the given number.

8. Which of the following is equal to its own cube?

I. -1
II. -2
III. -3
IV. -9

9. Which of the following is the cube root of 27000?

I. 30
II. 300
III. 3000
IV. None of these

10. Which of the following is the cube root of -64/243?

I. 7/4
II. -7/4
III. 4/7
IV. -4/7

State whether the statements are true (T) or false (F).

11. The cube of 6 will have 6 at the units place.
12The sum of two perfect cube is a perfect cube.
13The product of two perfect cube is a perfect cube.
14.There is no cube number between 50 and 60.
15.The cube root of 1331 is 11.
16.Each prime factor appears 3 times in its cube.
17.The cube of 12 is 144.
18.The cube root of 2.7 is 0.3.
19.The cube of every natural number is always greater than the number itself.
20..There are five perfect cube number between 1 and 100.

II. SECTION - B (THREE MARKS)

21 What is the smallest number by which 288 must be multiplied so the product is a perfect cube?
22 Find the cube of 4/5.
23.. Show that 0.001728 is a cube root of a rational number.
24 Find the sides of a cubical box whose volume is 64 cm^3.
25. If the surface area of a cube is 486 cm^2, find its volume.
26 Find the volume of a cube whose surface area is 96 cm2.
27.Write all the digits that would appear as the last digits of their respective cubes.
28.Show that if a number is doubled, then it cube becomes eight times the cube of the given number.
29. Is 343 or 243 a perfect cube?
30. Find the cube root of 8000.
31. Find the cube root of 13824.

32. Is 292 a perfect cube? If not find the smallest natural number by which it must be multiplied so that the product is a perfect cube.
33. Show that 1728 is a perfect cube.
34. What is the number whose cube is 216?
35. Find the smallest number by which 68600 must be multiplied to get a perfect cube.
36. Which smallest natural number should divide 1188 so that the quotient is a perfect cube?
37. Is the cube of 4913 an odd number? Why?
38. Is the cube of 132651 an even number? Why?
39. Check whether 1728 is a perfect cube by using primefactorisation.
40. By what smallest number should 3600 be multiplied so that the quotient is a perfect cube. Also find he cube root of the quotient.
41 Is 9000 a perfect cube? If not why ?

III. SECTION - C (FOUR MARKS)

42. By which smallest number should 42592 be divided so that the quotient is a perfect cube?
43. Show that 46656 is a perfect cube.
44. By which smallest number should 704 be divided to obtain a perfect cube?
45. Find the cue root of 9197.
46. Show that 384 is not a perfect cube.
47. By which smallest number should 648 be multiplied so that the product is a perfect cube?
48. Find the number whose cube is 27000.
49. The dimensions of a rectangular field are 80m and 18m. Find the length of its diagonal.
50. Three numbers are in the ratio 1:2:3 and the sum of their cubes is 4500. Find the numbers.

COMPARING QUANTITIES

I. SECTION - A (ONE MARK)

1. On what a discount is calculated?
    a. s.p.
    b. m.p.
    c. marked price
    d. none of these
2. On which figure the VAT of a product is calculated?
    a. s.p.
    b. c.p.
    c. market price
    d. none of these
3. On which of the following percent profit or profit loss is calculated?
    a. s,p.
    b. c.p.
    c. market price
    d. none of these
4. If an article sold for Rs 100 then there is a gain of Rs 20, which of the following is the gain percent?
    a. 25%
    b. 22%
    c. 20%
    d. 16 . %

5. An article is at 10% more than the CP. If discount of 10% is allowed then which of the following is right?
    a. 1% gain
    b. 1% loss
    c. no gain no loss
    d. 1.1% loss
6. A building worth Rs a is depreciated by R% per annum. Which of the following is true?
    a. P[1- 5/100]
    b. P [1+5/100]
    c. P[(1+5/100)-1]
    d. P[1-(1-5/100)]
7. If MP of a box is Rs 10 and a discount of 10% is allowed then what should be the sale price?
    a. Rs 10
    b. Rs 9
    c. Rs 11
    d. none of these
8. What should be the rate of interest per annum if interest is calculated quarterly?
    a. reduced to half
    b. reduced to one fourth
    c. is doubled
    d. becomes four times
9. What time period is taken when interest is calculated half yearly?
    a. twice as much as the number of given years
    b. half as much as the number of given years
    c. same as the number of given years
    d. none of these
10. what should be percentage gain on a product when it is sold for Rs 120 with a gain of Rs 20.
    a. 20% b. 25%
    c. 22% d.16.25%

State whether the statements are true (T) or false (F).

11. To calculate the growth of a bacteria if the rate of growth is known, the formula for calculation of amount in compound interest can be used.
12. Additional expenses made after buying an article are included in the cost price and are known as Value Added Tax.
13. Discount is a reduction given on cost price of an article.
14. Compound interest is the interest calculated on the previous year's amount.
15. C.P. = M.P. – Discount.
16. A man purchased a bicycle for Rs 1,040 and sold it for Rs 800. His gain per cent is 30%.
17. Three times a number is 200% increase in the number, then one-third of the same number is 200% decrease in the number.
18. Simple interest on a given amount is always less than or equal to the compound interest on the same amount for the same time period and at the same rate of interest per annum.
19. The cost of a sewing machine is Rs 7,000. Its value depreciates at 8% p.a. Then the value of the machine after 2 years is Rs 5,924.80.
20. The cost of a book marked at Rs 190 after paying a sales tax of 2% is Rs 192.

II. SECTION - B (THREE MARKS)

21. a shopkeeper purchased 200 bulbs for Rs.10 each. However 5 bulbs were fused and had to be thrown away. The remaining were sold at Rs 12 each. Find the gain or loss per cent.
22. A second hand TV is for Rs 2500. And then Rs 500 was spent on its repair and sold for Rs 3300. Find profit/loss percent.
23. What amount has to paid to on a loan of Rs 12000 for 1½ years at 10% per annum compounded half yearly.
24. The population of a city was Rs20,000 in 1997. It increased at the rate of 5% per annum. Find the population of city at the end of the year 2000.
25. A fan is marked at Rs 15600 and it is available for Rs 12480. Find the discount given and discount percent
26. Convert $\frac{3}{4}$ as percentage.
27. What should be the current price of the box which was Rs 25000 last year and it increased by 20% this year.
28. Find the population of a city after 2 years, which is at present is 20 lakh, if the rate of increase is 5%p.a.
29. What is the percentage of 5 oranges out of 25 fruits? 1
30. Rahul got 150 marks out of 200 and Prabha got 180 marks out of 300. Whose performance is better?

III. SECTION - C (FOUR MARKS)

31. Find the whole quantity if 5%of the quantity is 80.
32. A shirt is marked at rs 850 and is sold for Rs. 765. What is the discount and discount percent?
33. The cost of a pair of roller skates at a shop was Rs 450. The sales tax charged was 5%. Find the bill amount.
34. Akansha bought a toy car at Rs 300 including a tax of 10%. Find the price of the air cooler before the VAT.
35. 18% of a class took part in a karate competition. If 18 students have taken part in it, then what is the total number of students in the class?
36. A shirt is marked at Rs. 850 and is sold for Rs 765. What is the discount and discount percent.
37. If customers pay VAT to the shopkeeper in addition to selling price, is the VAT a part of profit?
38. What is the formula to calculate the compound interest.
39. Anything spend on an item say cost spent is Rs 15 on its transportation. And the item purchased for Rs 100. The actual cost price of the item for the shopkeeper is Rs 85 or Rs. 115
40. On which amount the overhead charges are added CP or SP.
41. What should be the sales tax when cost of doll us Rs750 and sales tax is charged 5%. Also find bill amount.
42. A sum of Rs 10,000 is borrowed at a rate of interest 15%p.a. for 2 years. Find simple interest and the amount to be paid at the end of 2 years.
43. Mario invested Rs8,000 in a domain. She would be paid interest ar 5% per annum calculated annually. Find: (i) the amount credited against his name at end of third year.
44. The cost of shoes was Rs. 700. The sales tax charged was 10%. Find the bill amount.
45. What should be price before VAT of a pair of shoes for Rs 300 including a tax of 10%.
46. Vanshika got 150 out of 200 and Sakshi got 120 marks out of 180. Whose performance is better.
47. The marked price of an article is Rs 500. The shopkeeper gives a discount of 5% and still makes a profit of 25%. Find the cost price of the article.
48. Jyotsana bought a product for Rs 3,155 including 4.5% sales tax. Find the price before tax was added.
49. A watch worth Rs 5400 is offered for sale at Rs 4,500. What per cent discount is offered during the sale?

50. Given the principal = Rs 40,000, rate of in e est = 8% p.a. compounded annually. Find theAmount if period is 2 years.

ALGEBRAIC EXPRESSIONS

SECTION A (one marks)

1. Volume of the cuboid with Length as 2x, breadth as 2y and Height as 2 z is given by --------
2. The sum of area of the squares of side 2a and 2b will be---------
3. What are the coefficient of each term in the given expression? $4p^2q^2 + 4p^2q^2r^2 - r^2 + 5$.
4. The product of a monomial and trinomial will be a ----------
5. The exponents of a variable term in the polynomial is a----------
6. The expression pqr + rqp + qpr is a ----------
7. Find the product of 11x and 12x.
8. What is the coefficient of x^3 in $4x^3 + 4x^2 – 5x + 8$?
9. Find the value of: $x^2 – 1/5$ at x= -1.
10. What is the value of $x^2 + y^2 – 10$ at x = 0 and y = 0?
11. Find the product of 9a, 4ab and -2a.
12. Simplify (a + b + c)(a + b - c).
13. Using identities evaluate: 8.56 × 11.60.
14. Using identities evaluate: $(99)^2$.
15. Simplify :x(2x – 1) + 5 and find its value at x = -2.
16. Evaluate the value of $(95)^2$ using identities.
17. What is the numerical coefficient of x^2y^2?
18. What is the numerical coefficient of -5xy?
19. What type of polynomial is pqr?
20. The value of x^2 - 5 at x= -1 is-----
21. a^2-b^2 is a product of-----
22. The value of $(\frac{x+1}{x^2})^2$is -----
23. Subtract x^2-y^2 from y^2 - x^2?
24. What degree does x^3 - x^2y^2 - $8y^2$+ 2 have?
25. What is the value of $5x^{25} - 3x^{32} + 2x^{-12}$ at x=1?
26. What is the product of (x+a) and (x+b)?

SECTION B (Three marks)

1. Find $(2x + 3y)^2$ using algebraic identities.
2. Using suitable identities find $(1092)^2$.
3. Using the identity $(a-b)^2 = a^2 - 2ab + b^2$, find $(5a + 7b)^2$.
4. Find 194 × 206 using suitable identity.
5. Use a suitable identity to find the product of (3a + 1/3)(3a - 1/3).
6. The length and breadth of a rectangle are $3x^2 + 2$ and 2x+ 5 respectively. Find its area.
7. Find the product of the following expression
   (a) 11, 7x
   (b) - 4x, y
   (c) - 4p, pq, pr
   (d)$4p^3$, - 3p, p^2
   (e) 3mn, 4n
   f) 51p, p^2, p^8
   g) 2p, 4q, 8r
   h) xy, $2x^2y$, $2xy^2$, xy
   i) a, 2b, 3c
   j) xy, yz, zx
   k) 2, 4y, $8y^2$,$16y^3$

l) a, 2b, 3c, 6abc

m) p, - pq, pqr

8. Identify the terms, their coefficients for each of the following expressions.

(i) $xyz^2 + 3xy$

(ii) $1 - x - 2x^2$

(iii) $4p^2q^2 – 4p^2q^2r^2 + r^2$

(iv) $4 – xy + yz – xz$

(v) $(x/4) –(y/5) - y$

(vi) $1.3a – 2.6ab + 1.5b$

9. Classify the following polynomials as monomials, binomials, trinomials. Which polynomials do not fit in any of these three categories?

a)$x^2 + y^2$

b)1000-x

c)$x + x^2 + x^3 + x^4 + x^5$

d)$8 - y + -5x$

e)$2y – 3y^2$

f)$2y – 3y + 4y^3$

g)$5x – 8y + 3xy$

h)$4 – 15z^2$

i)$ab + bc + cd + da + 2ab$

j)$pqr+2pq+5pqr$

k)$p^2q + pq^2$

l)$2p + 2q+1$

10. Add the following.

(i) $ab – bc + ac$, $bc – ca + ab$, $ca – ab - 2bc$

(ii) $p – q + pq$, $q – r + qr$, $r – p + pr$,$p+q+r$

(iii) $2p^2q^2 – 3pq + 4$, $5 + 7pq – 3p^2q^2$,$4p^2q^2 + 10pq$

(iv) $a^2 + b^2$, $b^2 + c^2$, $c^2 + a^2$, $2ab + 2bc + 2ac$

11..Subtract :

(a) Subtract *$8a – 7ab + 3b - 20$* from *$20a – 9ab + 5b – 20$*

(b) Subtract *$3pq + 5qr – 7pr+1$* from *$-4pq +2qr – 2pr + 5pqr+1$*

(c) Subtract *$4p^2q – 4pq - 5pq^2 – 8p + 7q – 18$*from *$18 – 3p – 11q + 5pq – 2pq^2 + p^2$*q

12.Use a suitable identity to get each of the following products.

a) $(p - 11) (p + 11)$

b) $(2y + 5) (2y - 5)$

c) $(12a - 9) (12a + 9)$

d) $(2a-1/2)(2a-1/2)$

e) $(1.1m - 0.4) (1.1m + 0.4)$

f) $(a^2+ b^2) (- a^2+ b^2)$

g) $(6x - 7) (6x + 7)$

h) $(- a/2 + c/2) (- a/2 + c/2)$

i) $[(p/8)+(3q/4)] [(p/8)+(3q/4)]$

j) $(3a + 9b) (3a - 9b)$

k) $2(a - 9)^2$

l) $5(xy - 3z)^2$

m) $(6x+ 5y)^2$

n) $36[(3p/2\}) + (2q/3)]^2$

o) $(x - 0.5y)^2$

p) $(2xy - 5y)^2$

13.Evaluate:

a) $p^2 -121$

b) $4y^2 -25$

c) $144a^2-81$

d) $4a^2+1/4 -2a$

e) $1.21m^2 - 16$
f) $b^4 - a^4$
g) $36x^2 - 49$
h) $c^2/4 - a^2/4$
i) $p^2/64 + 9q^2/16 + 3pq/16 = (p^2+36q^2+12pq)/64$
j) $9a^2-81b^2$
k) $4(a^2 + 81-18a)$
l) $25(x^2y^2+9z^2-6xyz)$
m) $36x^2+25y^2+60xy$
n) $36[9p^2/4 + 4q^2/9 + 2pq]= 9p^2+16q^2 + 64pq$
o) $x^2+.25y^2-xy$
p) $4x^2y^2+25y^2-20xy^2$

14.Use the identity $(x + a)(x + b) = x^2 + (a + b)x + ab$ to find the following products.
(i) $(p + 10)(p + 11)$
(ii) $(4x + 9)(4x + 12)$
(iii) $(x - 5)(x - 1)$
(iv) $(9x - 5)(9x - 1)$
(v) $(2x + 5y)(2x + 3y)$
(vi) $(2a^2+ 9)(2a^2+ 5)$

15.Simplify the following
(i) $(x^2- y^2)^2 + 4x^2y^2$
(ii) $(p + q)^2- (p - q)^2 + p^2q^2$
(iii) $(2m - 8n)^2+ (2m + 8n)^2$
(iv) $(4m + 5n)^2+ (5m + 4n)^2 + (4m + 5n)(4m -5n)$
(v) $(.5p - 1.5q)^2- (.5p - 1.5q)^2 +p^2q^2$
(vi) $(ab - bc)^2+2ab^2c$
(vii) $(m^2- n^2m)^2+ 2m^2n^2$

16.Using identities, evaluate.
a) 91^2
b) 89^2
c) 202^2
d) 999^2
e) 1.2^2
f) 397 x 403
g) 48 x 52
h) 5.1^2
i) $61^2- 59^2$
j) $11.1^2- 9.9^2$
k) 503 x 504
l) 2.1 x 2.2
m) 103 x 98
n) 9.7 x 9.8
o) $729^2- 271^2$

Section C (Four marks)

17.Find the value of x if $8x=35^2 -27^2$
18. If $a -1/a =4$, find the value of $a^2 + 1/a^2$
19. If $p +q =13$ and $pq =22$, then $p^2 + q^2$
20.Use the identity $(x + a)(x + b) = x^2 + (a + b)x + ab$ to find the following products.
(i) $(p + 10)(p + 11)$
(ii) $(4x + 9)(4x + 12)$
(iii) $(x - 5)(x - 1)$
(iv) $(9x - 5)(9x - 1)$
(v) $(2x + 5y)(2x + 3y)$

(vi) $(2a^2+ 9)(2a^2+ 5)$

21.Simplify the following

(i) $(x^2- y^2)^2 + 4x^2y^2$

(ii) $(p + q)^2- (p - q)^2 + p^2q^2$

(iii) $(2m - 8n)^2+ (2m + 8n)^2$

(iv) $(4m + 5n)^2+ (5m + 4n)^2 + (4m + 5n)(4m -5n)$

(v) $(.5p - 1.5q)^2- (.5p - 1.5q)^2 +p^2q^2$

(vi) $(ab - bc)^2+2ab^2c$

(vii) $(m^2- n^2m)^2+ 2m^2n^2$

22.Using identities, evaluate.

a) 91^2

b) 89^2

c) 202^2

d) 999^2

e) 1.2^2

f) 397 x 403

g) 48 x 52

h) 5.1^2

i) $61^2- 59^2$

j) $11.1^2- 9.9^2$

k) 503 x 504

l) 2.1 x 2.2

m) 103 x 98

n) 9.7 x 9.8

o) $729^2- 271^2$

23.Find the value of x if $8x=35^2 -27^2$

24. If $a - -\frac{1}{a} = 4$, find the value of $a^2 +\frac{1}{a^2}$.

25. If $p + q = 13$ and $pq = 22$, then $p^2 + q^2$

26. If $a + b = 12$, $b + c = 17$, and $c + a = 11$, then what is the value of $a + b + c$?

27. Find factors of following polynomial: a) $a^2 - 5a + 6$

b) $3y^2 -11y + 10$

28. If $9p^2 + 16q^2 = 25$, and $-3p + 4q = 1$, find value of pq.

29. Find factors of the following polynomial $18a^4 b \times (-23ab^2 + 19a^2 b^2 + 9a^4 b)$

30.Factorize $(81z^2 - 64)$.

31. Simplify: $[(5b + 3)^2 - 60b] \div (5b - 3)$.

32. Find product of $(a^2 - 2a + 2)$ and $(-2a^2 + 1)$ for $a = -3$.

33If the area and perimeter of a square are numerically equal, find the numerical value of its area.

34.Solve the following division of polynomials: a) $(24pq^2 + 12p+ 3q^2) \div (12pq^2)$

b) $(80ab^3+ 60ab^4) \div (20ab^3)$

c) $(33x\ 3y\ 3 + 33x\ 3y\ 2) \div (y + 1)$

d) $(70pq + 56p\ 3q\ 3) \div (14pq)$

35. If the base of a triangle is $(-8y^2 + 2y + 4)$ and its height is $(-4y^2 - 6y - 2)$, then what is its area?

36. Solve the following polynomial divisions:

a) $(p^2 - 10p + 25) \div (p - 5)$

b) $(5q^2 - 39q + 54) \div (q - 6)$

VISUALISING SOLID SHAPES
SECTION A (one marks)

1. Number of dimensions a line can have is
   A. zero
   B. infinite
   C. one
   D. negative

2 Line which is perpendicular to line passing through intersection point is called
   A. triangular
   B. normal
   C. trigonometrical
   D. angular

3.Dimensions of solid includes
   A. length
   B. breadth
   C. height
   D. all of above

4. Number of dimensions a point can have is
   A. zero
   B. infinite
   C. one
   D. negative

5.Surface like blackboard is classified as
   A. vertex plane
   B. triangular plane
   C. trigonometrical plane
   D. plane

6. How many number of faces does a solid sphere has?
   A. 1
   B. 2
   C. Many
   D. None

7.How many number of vertices does a cone has?
   A. 1
   B. 2
   C. 3
   D. None of these

8. How many number of faces does a hemisphere has?
   A. 1
   B. 2
   C. Many
   D. None of these

9. Which of the following is a triangular pyramid having all the faces as equilateral triangle?
   A. Rectangular pyramid
   B. Square pyramid
   C. Tetrahedron
   D. None of these

10.Which of the following is the number of vertices of sphere?
   A. 0 B. 1
   C. 2 D. 4

11. Which of the following can be other name of a cylinder?
   A. A triangular prism B. A rectangular prism
   C. A vertical prism D. A circular prism

12.If the base of a prism is a polygon of n sides, then which of the following is the number of faces of the prism?

A. n+2
B. n+1
C. n
D. n-1

13.If F, E and V represent the faces, edges and vertices respectively of a polyhedral then which of the following is the Euler formula?

A. F - V + E = 2
B. F + V + E = 2
C. F + V - E = 2
D. F + V =2 - E

14.Which of the following is the base of a tetrahedron?

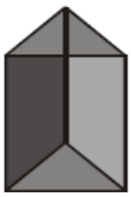
A. A square
B. A rectangle
C. A circle
D. A triangle

15. Which of the following is the other name of a cube?

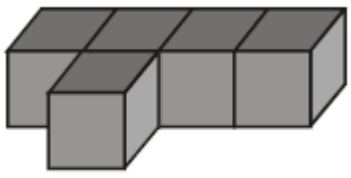
A. A tetrahedron
B. A regular hexahedron
C A square antiprism
D. A cuboctanedron

SECTION - B(Three marks)

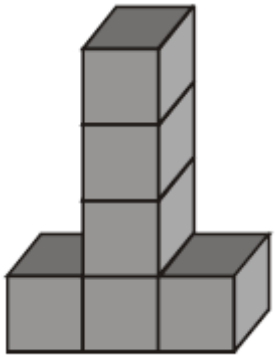
1.Find the number of edges in a triangular Prism.
2.A polyhedron has 6 edges and 4 faces. Find its number of vertices.
3.In the given solid find the number of faces.



4.In a polyhedron there are 8 edges and 5 faces. Find its number of vertices.
5.Find the number of edges in a Prism with hexagonal base.
6.Find the number of faces in a Prism with square base.
7.Find the number of edges in a Prism with square base.
8.In the given solid how many no. of squares are visible in the side view of the given figure.



9.In the given solid how many number of squares are visible in the front view of the given figure.



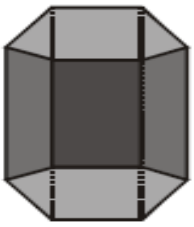
10.If the total angle sum of a polygon is 1080° then how many sides does polygon has?
12.Find the number of vertices in a Prism with square base.
13.Find the number of faces in a Prism with triangle base.
14.In a polyhedron there are 5 faces and 6 vertices. Find its number of edges.
15.In the given solid find the number of faces.

16.Find the number of vertices in a Pyramid with pentagon base.
17.Find the number of vertices in a Prism with pentagon base.
18.A polyhedron has 7 vertices and 12 edges. Find its number of faces.
19.Find the number of vertices in a Prism with hexagonal base.
20.Find the number of faces in a Pyramid with pentagon base.

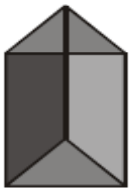
SECTION.C(Four marks)

1.In the given solid find the number of vertices, the number of edges, & the number of faces.

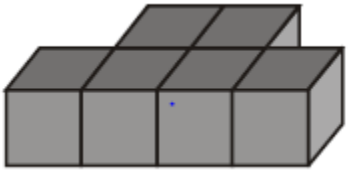
2.In the given solid find the number of vertices, the number of edges, & the number of faces.



3.In the given solid find the number of vertices, the number of edges, & the number of faces.



4.In the given solid how many number of squares are visible in the front view of the given figure.



5.Name the shape and also tell the type of the given figure.

6.Name the shape and also tell the type of the given figure.

7.Name the shape and also tell the type of the given figure

8. A polyhedron has 30 edges and 12 vertices. How many faces does it have?
9. A polyhedron has 5 faces and 6 vertices. How many edges does it have?
10. What is Euler formula? Verify the Euler formula for a pentagonal prism.
11. What is a least number of planes that can enclose a solid?
12. Name the simplest regular polyhedron and verify Euler formula for it.
13. Verify Euler's formula for these solids.


(i)


(ii)

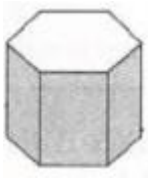
14. Using Euler's formula find the unknown.

	(i)	(ii)	(iii)
Forces	?	5	20
Vertices	6	?	12
Edges	12	9	?

15.Why the following solids are not polyhedron?

(i) A sphere.
(ii) A cone.
(iii) A cylinder.

16 Name the following polyhedron.



17 How many faces, vertices and edges of this solid are there?
18.What is the least number of planes that can enclose a solid?
19. How many vertices are there of a sphere?
20.Which of the following is not a polyhedron? A cube, a prism, a cone or a cuboid?
21.How many faces, edges and vertices does a triangular prism have?
22. What is a triangular pyramid? What is a pyramid called if it has a square base?
23.A dice is a cube in which the number on the opposite faces must total 7. Draw its net.
24.The number of face of a pyramid is 5. Find the number of its vertices when its edges are eight.
25. Draw the net of a triangular prism whose base is an equilateral triangle.
26.What is EulerFormula? Using it find the number of faces of tetrahedron having vertices as 4 and 6 edges.
27. How many vertices are there in a cone?

MENSURATION
(One mark)

MULTIPLE CHOICE QUESTIONS

1. Which of the following is the once of a rhombus?
   (i) Product of its diagonals
   (ii) $\frac{1}{2}$ (sum of its diagonals)
   (iii) 2 (Product of its diagonals)
   (iv) 2 (Product of its diagonals)
2. If the edge of a cube is 1 cm then which of the following is its volume?
   (i) 6 m^3
   (ii) 3 m^3
   (iii) 1 m^3
   (iv) none of these
3. If the parallel sides of a parallelogram are 2 cm apart and their sum is 10 cm then its area is:
   (i) 20 cm^2
   (ii) 5 cm^2
   (iii) 10 cm^2
   (iv) none of these
4. Which of the following has its area and perimeter numerically equal?
   (i) an equilateral triangle of side 1 cm
   (ii) a square of side 1 cm
   (iii) a square of side 1 cm
   (iv) a regular pentagon of side 1 cm.
5. If the edge of a cube is 1 cm then which of the following is its total surface area?
   (i) 1 cm^2
   (ii) 4 cm^2
   (iii) 6 cm^2
   (iv) none of these
6. Which of the following is equal to 1 kilolitre?
   (i) 1000 millilitres
   (ii) 100 dm^3
   (iii) 1 dm^3
   (iv) 1000 dm^3

7. If the dimensions of a room are I, b and h, (∴ l → length, l → breadth and h → hight) them which of the following is the area of its four walls?

(i) 2 h(1 + b)
(ii) 2 h (1 + h)
(iii) 2 1(h + h)
(iv) 2 h + 1 + b

8. If the dimensions of a room are 2 m, 3 and 4 m then which of the following is the number of cubes of size $\frac{1}{2}m \times \frac{1}{3}m \times \frac{1}{4}m$ which can he placed is the room?

(i) 960
(ii) 672
(iii) 676
(iv) 576

9. If base area of a room 12 m^2 and height is 3 m then its volume is:

(i) 4 m^3
(ii) 36 m^3
(iii) 12 m^3
(iv) 18 m^3

10. Two identical cubes each of total surface area of 6 cm^2 are joined end to end. Which of the following is the total surface area of the cuboid so formed?

(i) 12 cm^2
(ii) 18 cm^2
(iii) 10 cm^2
(iv) 8 cm^2

11. Surface area of cylinder= A) 2 π r(r+h)B) 2(lb+bh+hl)C) 6 l cube D) l X b X h

12.Total Surface area of cylinder= A) 2 π r hB) 2(lb+bh+hl)C) 6 l cube D) l X b X h

13.If the dimensions of a room are 2m , 3m , and 4m then which of the following is the number of cubes of size 1/2m*1/3*1/4m which can he placed is the room ?

A) 960 B) 672 C) 676 D) 576

14.Amount of space occupied by a three dimensional object is called its _____.

15.A road roller takes 1500 complete revolutions to move once over to level a road. Find the area of the road if the diameter of a road roller is 168 cm and length is 2 m.

A)15840msq B)15845msq C) 15850msq D) 15860msq

19.Which of the following has its area and perimeter numerically equal ?

A) An equilateral triangle of side 1 cmB) A rectangle of side 1 cmC) A square of side 1cmD) A regular pentagon of side 1cm

20. Volume of cube= --------

SECTION B(Three marks)

1. The length, breadth and height of a cuboid are 20 cm, 15 cm, 10 cm respectively. Find its total surface area.
2. In a building there are 24 cylindrical pillars with each having a radius 28 cm and height 4 m. Find the cost of painting the curved surface area of all pillars at the rate of Rs. 8 per meter square.
3. Find the height of cylinder whose radius is 7 cm and total surface area is 968 cm^2.
4. A box is in the form of cuboid of dimensions (80*30*40) cm. The base the side faces and back faces are to be covered with a coloured paper. Find the area of paper needed.
5. The lateral surface area of a hollow cylinder is 4224 cm^2. It is cut along its height and formed a rectangular sheet of width 33 cm. find the perimeter of rectangular sheet.
6. A roller takes 750 complete revolutions to move once over a level of road. Find the area of road if the diameter of the roller is 84 cm and length is 1 m.

7 A godown in the form of a cuboid measures (60*40*30) m. how many cuboidal boxes can be stored in it if the volume of one box is 0.8 m^3.

8. A rectangular paper of width 14 cm is rolled along with its width and a cylinder of radius 20 cm is formed. Find the volume of the cylinder.
9. A rectangular piece of paper is having measures 11 cm * 4 cm. It is folded without overlapping to make a cylinder of height 4 cm. Find the volume of the cylinder.
10. A square and a rectangle have same perimeter. If the side of the square is 60 cm and length of a rectangle is 80m, then whose area is more and how much?
11.The area of a quadrilateral shaped field is 252 m^2. The perpendiculars dropped on it from the opposite corners on a diagonal are 8 m and 13 m. Find the length of a diagonal.
12.If each side of a cube is doubled, how many times will its surface area increase?
13.Find the height of a cuboid whose base area is 180 cm^2 and volume is 900 cm^3.
14. A cuboid is of dimensions (60*50*30)cm .How many small cubes with side 6 cm can be placed in the given cuboid?
15. Find the height of the cylinder whose volume is 1.54 m^3 and diameter of base is 140 cm.
16. Find the area of trapezium where length of parallel sides are 15 cm and 25 cm and the third side measures 12 cm.
17. Find the area of rhombus whose diagonals are 8cm and 10cm.
18. If each side of a cube is doubled, how many times will its volume increase?
19. A rectangular sheet of paper is having measures 11 cm* 4 cm. it is folded without overlapping to make a cylinder of height 4 cm. Find the volume of the cylinder.
20. There are two cuboidal whose dimensions are given below. Which box requires the higher amount of material to make?
Cuboid A: L=23, B=30, H=40
Cuboid B: L=30, B=12, H=44
21.Three cubes, each of edge 2 cm. long are placed together. Find the total surface area of the cuboid so formed?
22. Find the side of a cube whose surface area is 2400 cm^2.
23 Meghna painted the outside of the cabinet of measure 2 m × 3 m × 2.5 m. How much surface area did she cover if she painted all except the bottom of the cabinet and back side?
24. Ahmed is painting the walls and ceiling of a cuboidal hall with length, breadth and height of 25 m, 12 m and 8 m respectively. From each can of paint 200 m^2 of area is painted. How many cans of paint will she need to paint the room?
25.A open cylindrical tank of radius 14 m and height 3 m is made from a sheet of metal. How much sheet of metal is required?
26. The lateral surface area of a hollow cylinder is 4224 cm^2. It is cut along its height and formed a rectangular sheet of width 33 cm. Find the perimeter of rectangular sheet?
27.A road roller takes 750 complete revolutions to move once over to level a road. Find the area of the road if the diameter of a road roller is 84 cm and length is 1 m.
28.A rectangular sheet of metal foil is 88 cm. long and 20 cm. wide. A cylinder is made out of it, by rolling the foil along width. Find the volume of the cylinder.
29. The perimeter of the floor of a hall is 250 m. If the height is 4 m, find the cost of painting the four walls at the rate of Rs. 12 per square meter.
30. How many times do the volume and surface area of a cube increase if its edges get tripled.
31. How many times do the volume and surface area of a cylinder increase if its radius doubled and height remains same.
32 How many times do the volume and surface area of a cylinder increase if its radius remains same and height is doubled.
33.The height of a cylinder is 15 cm. and curved surface area is 660 cm^2. Find the radius of the cylinder
34. Find the area of a rhombus whose diagonals are of lengths 12 cm and 9.2 cm.
35.Find the base area of a cuboid whose volume and height are 900 cm cube and 5 cm.
36.A hall is in the form of a cuboid of measures 120 m × 80 m × 60 m. How many cuboidal boxes can be stored in it if the volume of one box is 0.16 m cube?
37.Find the height of a cuboid whose volume is 550 cm3 and base area is 50 cm sq. .
38.The lateral surface area of a hollow cylinder is 8448 cm2.It is cut along its height and formed a rectangular sheet of width 66 cm. Find the perimeter of rectangular sheet?

39.The area of a quadrilateral shaped ground is 252m sq. The perpendicular dropped on it from the opposite corners on a diagonal are 8 m and 13 m. Find the length of the diagonal.
40.Water is pouring into a cuboidal reservoir at the rate of 120 liters per minute. If the volume of reservoir is 216 m cube, find the number of hours it will take to fill the reservoir.
41.A box is in the form of a cuboid whose external measures are 40 cm × 15 cm × 20 cm. The base, side faces and back face are to be covered with a colored paper. Find the area of the paper needed?
42.A rectangular piece of paper 22 cm × 8 cm is folded without overlapping to make a cylinder of height 8 cm. Find the volume of the cylinder.
43.The diagonals of a rhombus are 15 cm and 24 cm. Find its area.
44.Find the area of the trapeziums whose length are 9cm and 7cm and height 3 cm.
45.The area of a quadrilateral shaped ground is 252m sq. The perpendicular dropped on it from the opposite corners on a diagonal are 8 m and 13 m. Find the length of the diagonal.
46.A closed cylindrical tank radius 7 cm and height 5 m is made from a sheet of metal. If the breadth of the rectangular sheet is m. Find the length of the sheet.
47.The shape of a field is rectangular in the middle and semi circular at the ends . Find the area and the perimeter of this field [Length of rectangle is 20 – (3.5 + 3.5) meters].
48.Find the area of a rhombus whose side is 12 cm and whose altitude is 8 cm If one of its diagonals is 16 cm long, find the length of the other diagonal.

SECTION C (Four marks)

1. Given a cuboid tank, in which situation will you find surface area and in which situation volume.
   (a) To find how much it can hold.
   (b) Number of paint bottle required to paint it.
   (c) To find the number of smaller tanks that can be filled with water from it.
2. Compare the volumes
   a) Cube (side =12 cm)Cuboid (L=11 cm, B=12 cm, H=13 cm)
   b) Cylinder (r=10 cm , H=14 cm)Cuboid (L=10 cm, B=11 cm, H=14 cm)
3. Find following
   a) the height of a cuboid whose base area is 180 cm^2 and volume is 900 cm^3?
   b) The side of cube whose volume is 64 m^3
   c) Volume of the cylinder whose base area is 20 cm^2 and height is 10 cm
4. A cuboid is of dimensions 60 cm × 54 cm × 30 cm. How many small cubes with side 12 cm can be placed in the given cuboid?
5. Find the height of the cylinder whose volume is 2.54 m^3 and diameter of the base is 140 cm?
6. A water tank is in the form of cuboid whose length is 1.5 m , height is 2 m and Breath is 7 m. Find the quantity of water in litres that can be stored in the tank?
7. If each edge of a cube is quadrupled,
   (i) how many times will its surface area increase?
   (ii) how many times will its volume increase?
8. Water is pouring into a cuboidal reservoir at the rate of 60 liters per minute. If the volume of reservoir is 108 m^3, find the number of hours it will take to fill the reservoir.
9. If Length, Breath, Height of a cuboid is tripled,
   (i) how many times will its surface area increase?
   (ii) how many times will its volume increase?
10. If radius of cylinder is tripled and height remains same
   (i) how many times will its surface area increase?
   (ii) how many times will its volume increase?

EXPONENTS AND POWERS
SECTION A(One marks)

1. What is the value of $(-1)^{-1}$?
   I. 0
   II. -1
   III. 1
   IV. None of these
2. Which of the following is the value of 'm' in $6^m / 6^{-3} = 6^5$?
   I. -3
   II. -2
   III. 3
   IV. 2
3. Which of the following is the standard form of 0.00001275?
   I. $1.275 * 10^{-5}$
   II. $1.275 * 10^5$
   III. $127.5 * 10^{-7}$
   IV. $127.5 * 10^7$

4. Which of the following is used as a form of $5.05 * 10^6$?
   I. 505000
   II. 505000000
   III. 5050000
   IV. 50500000
5. $[(1 / 2)^{-1} + (2 / 3)^2 - (3/4)^0]^{-2}$ is equal to:
   I. 81/484
   II. 81/169
   III. 169/81
   IV. None of these
6. Which of the following = $(100 - 99^0) \times 100$?
   I. 10000
   II. 100
   III. 9900
   IV. 99000
7. What is the reciprocal of $(-3 / 4)^0$?
   I. -1
   II. 1
   III. -4/3
   IV. 4/3
8. Which of the following is the value of $(4 / 5)^{-9} / (4 / 5)^{-9}$?
   I. $(4/5)^{18}$
   II. 4/5
   III. 1
   IV. $(5/4)^9$
9. The value of 2^5 is _____ .
   (a) 3 (b) 10 (c) 32 (d) 7
10. 13×10^{-7} Km is the standard form of which of the following
   (a) 0.000000013 Km (b) 0.0000013 Km(c) 0.000000000013 Km (d) 0.00000000013 Km
11. The standard form of 9030000000 is given by
   (a) 9.03×10^9 (b) 90.3×10^7 (c) 903×10^{-7} (d) 9.03×10^{-10}
12. The Base in the expression 10^{24} is _____.
   (a) 1 (b) 10 (c) 0 (d) 24
13. The value of 3^0 is _____.

(a) 0 (b) 3 (c) 1 (d) None of these

14. Multiplicative inverse of 7^{-2} is _____ .

(a) 49 (b) 5 (c) 7 (d) -14

15. Fill in the blank $a^m \times a^n =$ -------. where m and n are natural numbers.

16. The exponential form of $1/8 \times (3)^{-3}$ is given by which of the following expression:

(a) 6^{-3} (b) 2^3 (c) 3^{-6} (d) 5^{-3}

17. The value of $(1/3)^{-2}$ is equal to(a) 9 (b) 1 (c) -6 (d) 1/3

18. In exponential form 149,600,000,000 m is given by :

(a) 1.496×10^{11} m (b) 1.496×10^8 m (c) 14.96×10^8 m (d) 14.96×10^{11} m

19. In simplified form $(3^{-1} + 4^{-1} + 5^{-1})^0$ is equals to

(a) 12 (b) -3 (c) 12^{-1} (d) 1

20. The value of $(2/3)^{-2}$ is

(a) 4/9 (b) -2/9 (c) 9/4 (d) 0

21. In standard form 21600000 is written as

(a) 2.16×10^7 (b) 216×10^7 (c) 2.16×10^8 (d) 216×100000

22. Usual form of the expression $3 \text{ X } 10^{-5}$ is given by

(a) 0.00003 (b) 0.000003 (c) $30 \text{ X } 10^{-4}$ (d) $0.03 \text{ X } 10^{-3}$

23. 1 micron is equals to

(a) 1/10000 m (b) 10^6 m (c) 10^{-6} m (d) 10^{-5} m

24. The approximate distance of moon from the earth is 384,467,000 m and in exponential form. This distance can be written as

(a) $3.84,467 \times 10^8$m(b) $384,467 \times 10^{-8}$ m (c) $384,467 \times 10^{-9}$ m (d) $3.844,67 \times 10^{-13}$ m

25. 7×10^{-5} m is the standard form of which of the following

(a) 0.0007 m (b) 0.000007 m (c) 0.0000007 m (d) 0.00007 m

26. The standard form of 4050000 is given by

(a) 4.05×10^6 (b) 40.5×10^9 (c) 405×10^6 (d) 4.05×10^{-6}

27. Which one of the following is the value of 15^1

(a) 0 (b) 15 (c) 1 (d) None of these

28. 1/125 is the multiplicative inverse of

(a) 5^{-3} (b) $(1/5)^{-3}$ (c) -125 (d) 5^3

29. 16 is the multiplicative inverse of

(a) 2^{-4} (b) 2^8 (c) 8^2 (d) 2^4

30. Value of $(3^0 + 2^0) \times 5^0$ is-------

31.The approximate distance of moon from the earth is 384,467,000 m and inexponential form. This distance can be written as

(a) $3.84,467 \times 10^8$m(b) $384,467 \times 10^{-8}$ m (c) $384,467 \times 10^{-9}$ m (d) $3.844,67 \times 10^{-13}$ m

32. 7×10^{-5} m is the standard form of which of the following

(a) 0.0007 m (b) 0.000007 m (c) 0.0000007 m (d) 0.00007 m

33. The standard form of 4050000 is given by

(a) 4.05×10^6 (b) 40.5×10^9 (c) 405×10^6 (d) 4.05×10^{-6}

34. Which one of the following is the value of :1^{15}

(a) 0 (b) 15 (c) 1 (d) None of these

35. 1/125 is the multiplicative inverse of

(a) 5^{-3} (b) $(1/5)^{-3}$ (c) -125 (d) 5^3

36. The value of 7^2 is

(a) 7 (b) 49 (c) 2 (d) 14

37. The Base in the expression 8^{100} is

(a) 10 (b) 100 (c) 8 (d) 800

38. Which one of the following is the value of 3^5

(a) 3 (b) 15 (c) 2 (d) 243

39. 3^2 is the multiplicative inverse of

(a) 1/9 (b) 1/3-2 (c) 6 (d) 1/23

40. 2^4 is the multiplicative inverse of

(a)2^{-8} (b) 8^2 (c) $(1/8)^{-2}$ (d) 2^{-4}

SECTION B(Three marks)

1. Simplify $(1 / 3^2)^3$.
2. Evaluate: $(5^{-1} \times 8^2) / (2^{-3} \times 10^{-1})$.
3. Find the value of 'm' for which $6^m / 6^{-3} = 6^{5?}$
4. Evaluate $[(1/2)^{-1} - (1/3)^{-1}]^{-1}$.
5. Simplify: $(-3)^5 \times (5/3)^5$.
6. Compare 7×10^{-6} and 129×10^{-7}.
7. The size of a plant cell is 0.00001275 m. express it in standard form.
8. If the thickness of a paper sheet is 0.0016 cm, find the thickness of 100 sheets. Express the answer in standard form.
9. Find the value of: $\left(\frac{1}{4}\right)^{-2} + \left(\frac{1}{3}\right)^{-3} + \left(\frac{1}{2}\right)^{-4}$
10. Simplify: $\left[\left(\frac{-4}{5}\right)^{-2}\right]^2$
11 What is the reciprocal of 0.1?
12 What is the value of x in $5^x \div 5^{-3} = 5^5$?
13. Can be $\frac{a^m}{b^m}$ t equal to $\left(\frac{a}{b}\right)^m$?

14. Find the value of $5^{-3} * 1/5^3$.
15. Simplify $2^5 / 2^{-6}$.
16. Express 4^{-3} as a power with base 2.
17. Simplify and write the answer in exponential form: $(2^5 / 2^8)^5 * 2^{-5}$.
18. Find ï¿½mï¿½ so that $(-3)^{m+1} * (-3)^5 = (-3)^7$.
19. Find the value of $(2/3)^{-2}$.
20. Simplify: $(5/8)^{-7} \times (8/5)^{-5}$.
21 Simplify $(-4)^{-10} \times (-4)^5$

DIRECT AND INVERSE PROPORTIONS.
SECTION A (One marks)

1. If ‘x’ and ‘y’ are in a direct proportion then which of the following is correct?
   (i) x – y = constant (ii) x + y = constant
   (iii) x × y = constant (iv) $\frac{x}{y}$ = constant
2. If ‘x’ and ‘y’ are in an inverse variation then which of the following is correct?
   (i) x – y = constant (ii) x + y = constant
   (iii) xy = constant (iv) $\frac{x}{y}$ = constant
3. If ‘A’ can finish a work in ‘n’ days then part of work finished in 1 day is:
   (i) 1 – n (ii) $\frac{1}{n}$
   (iii) n – 1 (iv) none of these
4. If amount of work completed by ‘A’ in one day is $\frac{1}{n}$ then the whole work will be finished by ‘A’ is:
   (i) n days (ii) 1 – n days
   (iii) n – 1 days (iv) none of these.
5. If an increase in one quantity brings about a corresponding decrease in the other and vice versa, then the two quantities vary:
   (i) directly (ii) inversely
   (iii) sometimes directly and sometimes inversely (iv) none of these.
6. “If speed is more than time to cover a fixed distance would be less”. This is a ease of:

(i) inverse variation (ii) direct variation
(ii) direct variation (iv) none of the above.

7. Which of the following is not a case of direct variation?
   (i) Number of sheets of some kind are increased when their total weight its increased
   (ii) More quantity of petrol is required to travel more distance with a fixed speed
   (iii) More fees would be collected if number of students increased in a class
   (iv) Time taken will be less if number of workers are increased to complete the same work.
8. Which of the following is ease of direct variation;
   (i) If the length of radius is increased the circumference will be increased
   (ii) If number of students is a hostel are increased then the fixed food provision will last for less days
   (iii) For fixed duration, more the periods, lesser will be the duration of one period
   (iv) In case of a cylindrical vessel, lesser the diameter more is the level of water in it.

9. If x and y vary inversely. Then using the following table?

x	5
y	30

   The value of x for y = 10 is
   (i) 10 (ii) 40 (iii) 15 (iv) none of these
10. The ratio of girls to boys in a class is 2 : 3. The actual strength of the class is:
    (a) 12 (b) 15 (c) 16 (d) 18
11. Which of the following is true for a ratio?
    (a) the quantities are always in the same unit.
    (b) the quantities may be in different unit.
    (c) the quantities are always in different units.
    (d) none of the above.
12. If x and y are in Inverse variation then:
    (a) $\frac{x}{y}$ is constant (b) (x – y) is constant
    (c) xy is constant (d) (x + y) is constant.
13. If 14 kg of pulses cost $ 441, what is the cost of 22 kg of pulses?
    (a) $ 627 (b) $ 649 (c) $ 671 (d) $ 693
14. If 36 men can do a piece of work in 25 days, in how many days will 15 men do it?
    (a) 50 (b) 56 (c) 60 (d) 72
15. If 20 men can build a wall 56 metres long in 6-daysWhat length of a similar wall can be built by 35 men in 3 days?
    (a) 49 metres (b) 36 metres (c) 52 metres (d) 42 metres
16. 120 men had provisions for 200 days. After 5 days, 30 men died due to an epidemic. The remaining food will last for ……. .
    (a) 146 1/4 days (b) 150 days (c) 2251/2 days (d) 260 days
17. A garrison of 500 men had provisions for 24 days. However, a reinforcement of 300 men arrived. The food will now last for ……. .
    (a) 15 days (b) 16 days (c) 17 1/2 days (d) 18 days
18. 12 men, working 8 hours a day, complete a piece of work in 10 days. To complete the same work in 8 days, working 15 hours a day, the number of men required, is ……. .
    (a) 4 (b) 5 (c) 6 (d) 8
19. 39 persons can repair a road in 12 days, working 5 hours a day. In how many days will 30 persons, working 6 hours a day, complete the work?
    (a) 10 (b) 13 (c) 14 (d) 15

20. If men or 9 women can do a piece of work in 19 days then in how many days will 3 men and 6 women do the same work?
    (a) 12 (b) 15 (c) 18 (d) 21

SECTION B(Three marks)

1. A contractor estimates that 5 persons complete a task in 4 days. If he uses 4 persons instead of 5, how long should they take to complete the task?
2. A school has 9 periods a day each of 50 minutes duration. How many period will there be, if the duration of every period is reduced by 5 minutes?
3. 6 pipes are required to fill a rank in 1 hour 20 minutes. How long will it take if only 5 pipes of the same type are used?
4. There are 100 students in a hostel. Food provision for them is for 20 days. How long will these provisions last, if 25 more students join the group?
5. If 15 workers can build a wall in 48 hours. How many workers will be required to do the same work in 30 hours?
6. The principal sanctioned a certain amount to the librarian to purchase some Mathematics books for the school library. She could buy 80 books casting Rs 90 each from the local book seller. There she approached to the publisher who offered her a 20% discount, Find the number of copies of Mathematics books which she could buy from the publisher for the sanctioned money.
7. A mixture of paint is prepared by mixing 1 part of green pigments with 6 parts of the base. In the following table, find the parts of base needed to be added.

Parts of green pigment	1	4	5	6
Parts of base	6	x_1	x_2	x_3

8. A machine fills 540 bottles in six hours. How many bottles will it fill in five hours?
9. Jagmeet has a road map with a scale of 1 cm = 20 km. He drives on a road for 72 km. What would be his distance covered in the map?
10. In a PG House, the food provision for 20 persons is for 10 days. How long would the food provision last if there were 5 more persons in that PG house?
11. A machine can fill 420 bottles of mineral water in 3 hours. How many bottles can be filled in 5 hours?
12. A school has 9 periods a day each of 40 minutes duration. How long would each period be, if the school has 8 periods a day, assuming the number of school-hours to be the same?
13. In a model of a ship. the mast is 9 cm high, while the mast of the actual ship is 12 m high. If the length of the model ship is 21 cm, then how long is the actual ship?
14. If kg of sugar contains 2.25 ï¿½ 107 crystals. How many sugar crystals are there in 2 kg of sugar?
15 A 10 m 50 cm high vertical pole casts a shadow 6 m long. Find at the same time the length of the shadow c.ast by another pole 5 m 60 cm high.
16. A loaded truck travels 168 km in 5 hours. How far can it travel in 25 minutes?
17 A farmer has enough food to feed 30 animals in his cattle-fret for 4 days, How long would the food last if there were 10 less animals in his farm?
18. 4 persons can build a mom in 3 days. if there are only 3 persons to be engaged in the building task, then how long should they rake to complete the task?
19. If 20 bottles can he packed in 15 boxes. Then how many bottles of the same batch can be packed in each box when there are 25 boxes?
20. A car lakes 1.5 hours to reach a destination by travelling at the speed of 80 km/h. How long will it rake when the car travels at the steed of 60 km/hr?

FACTORISATION

SECTION A (One marks)

1. Which of the following is the common factor of 21 x^2y and 35 xy^2?
   (i) 7 (ii) xy (iii) 7 xy (iv) none of these.
2. Which of the following arc the factors of $1 - x^2$?
   (i) (x + l) (x – I) (ii) (1 – x) (1 + x) (iii) (1 – x) (1 – x) (iv) (1 + x) (1 + x).
3. Which of the following is the common factor of: 5xy, 3pqr and 40 xyz?
   (i) 5 (ii) 0 (iii) xy (iv) 1
4. Which of the following is quotient obtained on dividing –18 xyz^2 by –3 xz?
   (i) 6 Yz (ii) –6 yz (iii) 6 xy^2 (iv) 6 xy

5. Which of the following is quotient obtained on dividing $(x^2 - b)(x - a)$ by $-(x - a)$?

   (i) $(x^2 - b)$ (ii) $\frac{-(x^2 - b)}{(x - a)}$ (iii) $-(x^2 - b)$ (iv) $-(x + a)$

6. Which of the following are the factors of a2 + ab + bc + ca
   (i) ab – a – b + 1 = (1 – a)(1 – b)
   (ii) ab – a – b + 1 = (a – 1)(b – 1)
   (iii) ab – a – b + 1 = (1 – a)(b – 1)
   (iv) ab – a – b + 1 = (a – 1)(1 – b)
7. $(y - x)(y + x)$ is equal to which of the following:
   (i) $y^2 - yx$ (ii) $yx - x^2$ (iii) $y^2 - x^2$ (iv) $x^2 - y^2$
8. Which of the following are the factors of a2 + ab +bc + ca
   (i) (b + c) (c + a) (ii) (a + b) (a + c) (iii) a(a + b + c) (iv) (a + b) (b + c).
9. Which of the following is the factorisation of $x^3 - x$?
   (i) $x(x - x^2)$ (ii) $x[(1+ x)(1 - x)]$ (iii) $x(x^2 - x)$ (iv) $x[(x + 1)(x - 1)]$
10. Which of the following is equal to $x^3 - 225x$
    (i) $x(1 - 15x)(1 + 15x)$ (ii) $x(x - 15)(x + 15)$
    (iii) $x(1 - 15x)(1 - 15x)$ (iv) $x(1 + 15x)(1 - 15x)$

SECTION B(Three marks)

1. Simplify: $-45p^3 \div 9p^2$
2. Simplify: $4x^2y^2(3z - 24)$, $36xy(z - 8)$
3. Divide: $81x^3(50x^2 - 98)$ by $27x^2(5x + 7)$
4. Which of the following is the remainder when $z(5z^2 - 80)$ is divided by$5z(z - 4)$:
   (a) z + 4 (b) z – 4 (c) 5 (d) 0
5. Which of the following is the quotient when $44(x^4 - 5x^3 - 24x^2)$ is divided by $22x(x - 8)$:
   (a) x(x + 3) (b) 2x(x + 3) (c) 2(x – 3) (d) x(x – 3)
6. Which of the following is factorization of $(1 - x^2)$
   (a) (1 + x) (1 + x) (b) (1 – x) (1 – x) (c) (1 – x) (1 + x) (d) none of these
7. By which of the following $a^4 - b^4$ be divided to get quotient $(a^2 + b^2)(a - b)$ and, remainder as 0.
   (a) $a^2 + b^2$ (b) a – b (c) a + b (d) $a^2 - b^2$
8. Is (a – 1) (b – 1) the factorisation of (ab – a – b +1) or (ab – a + b – 1)?

SECTION C(Four marks)

1. Factorise: $27x^3 - 21x^2 + 15x^4$
2. Factorise: $ax^3y^2 + bx^2y^3 + cx^2y^2z$
3. Factorise: x – 9 + 9zy – xyz
4. Factorise:
   (i) $p^2 - 8p + 16$
   (ii) $121x^2 + 44xy + 4y^2$
5. Factorise: $54x^2 - 96y^2$
6. Divide $63(p^4 + 5p^3 - 24p^2)$ by $9p(p + 8)$.
7. Factorise: $54x^2 + 42x^3 - 30x^4$
8. Factorise: $2x^2yz + 2xy^2z + 4xyz$
9. Factorise: 30xy – 12x + 10y– 4
10. Regroup the terms and factorise: z – 19 + 19xy – xyz
11. Factorise: $100x^2 - 80xy + 16y^2$
12. Factorise: $16x^4 - y^4$
13. Factorise: $x^2 + 6x + 8$
14. Factorise: $49y^2 - 1$
15. Divide $10(x^3y^2x^2 + x^2y^3z^2 + x^2y^2z^3)$ by $5x^2y^2z^2$.
16. Simplify: $12(y^2 + 7y + 10) \div 6(y + 5)$

INTRODUCTION TO GRAPHS

SECTION A(One marks)

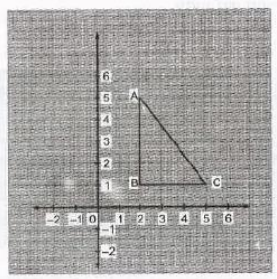
1. (o, y) are the co-ordinates of a point lying on which of the following?
   (i) origin (ii) x-axis (iii) y-axis (iv) none of these.
2. The point (3, 2) is nearer to:
   (i) x-axis (ii) y-oxis (iii) origin (iv) none of these.
3. The point (–5, 6) is nearer it:
   (i) x-axis (ii) y-oxis (iii) origin (iv) none of these.
4. The point (–3, –3) is
   (i) nearer to x-axis (ii) y-axis (iii) near to origin (iv)equidistant from x-axis and y-axis.
5. The point (0, 4) lies on which of the following:
   (i) x-axis (ii) y-oxis (iii) origin (iv) none of these.
6. The point (–3, 0) livs on which of the following?
   (i) x-axis (ii) y-oxis (iii) origin (iv) none of these.
7. The poits (–3, 2) and (2 , –3) represent:
   (i) different points (ii) same point (iii) the origin (iv) none of these.
8. By joining (–1, –1), (0, 0) and (3, 3) represent:
   (i) a triangle (ii) a curved line (iii) a straight line passing through origin
   (iv) a straight line not passing through origin.
9. By joining (–3 , 2) , (–3 , –3) and (–3, 4), which of the following is obtained?
   (i) a triangle (ii) A straight line not passing through origin
   (iii) A straight line passing through origin (iv) none of these.
10. Which of the following points lies on y-axis?
    (i) (–4 , 0) (ii) (4 ,0) (iii) (0 , –4) (iv)(–4 , 4)

SECTION B(Four marks)

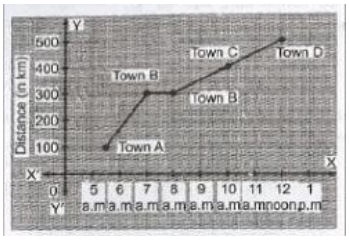
1. Draw the points (5, 4) and (4, 5). Do they represent the same point? Justify your answer.
2. Draw a line passing through (2, 1) and (1, 2). Find the coordinates of the points at which this line meets the x-axis and y-axis.
3. Draw the graph for the following table of values of time (in hours) and distances (in km) covered by a car.

Time (in hours)	7:00	8:00	9:00	10:00
Distance (in km)	60	120	180	240

   From the graph, find:
   (i) The distance covered by the car during the period 7:00 to 8:00.
   (ii) At what time the car would have covered 180 km?
4. Find the coordinates of the vertices of ï¿½ï¿½ABC given in graph. Draw a triangle by taking vertices as A(5, 2), B(1, 2) and C(1, 5).



5. Following graph describes the movement of a car from a town A to town D. Study the graph a l answer the following questions:



(i) What is the distance between town A and town D?

(ii) What did the car start from town A?

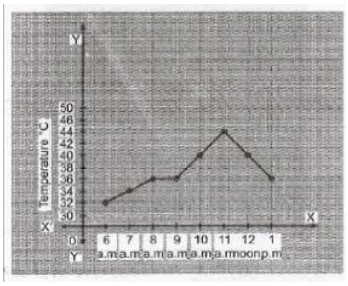
(iii) Where did the car stop and for what duration?

(iv) How long did it take to go from town C to town D?

6. Read the following `time-temperature' graph of a place and answer the questions given below.

(i) What was the temperature at 7 a.m.?

(ii) When the temperature was maximum?



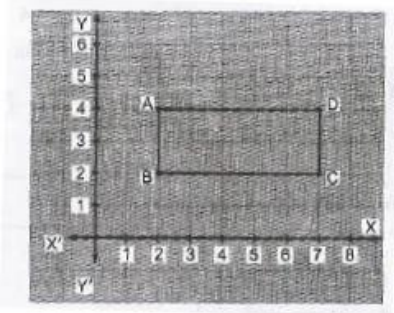
(iii) When was the temperature 40°C?

(iv) During which period, the temperature remained constant?

7. Draw a line passing through (4, 5) and (5, 4). Find the coordinates of the points is a straight line.

8. Show that the linear graph obtained by joining the following points is a straight line.
(6, –3), (6, 1), (6, 4) and (6, 6)

9. Look at the graph of a rectangle in the figure. What are the coordinates of its vertices?



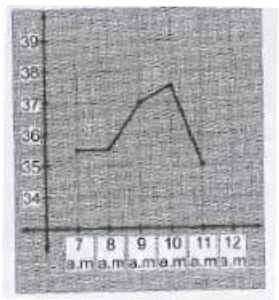
10. Draw a graph of ΔPQR, the coordinates of whose vertices are P(9, 5), Q(7, 7) and C(9, 9).

11. Draw a 'deposit-interest' graph for the following data:

Deposit (in Rs)	5000	6000	7000	8000	9000
Simple interest (in Rs) for 1 Year	400	480	560	640	720

From the graph, find the interest on Rs 7500 for 1 year.

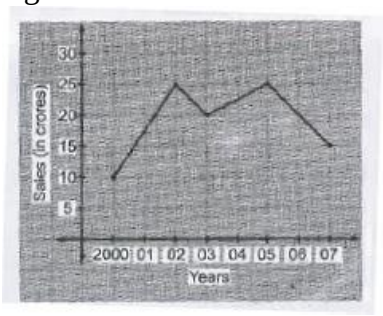
12. The graph shows the temperature of a patient recorded before noon. Read it and answer the following questions.



(i) What was patients temperature at 9 a.m.?

(ii) What the highest temperature of the patient?
(iii) When was the patient's temperature lowest?
(iv) During which period, the patient's temperature remained constant?

13. The graph shows the yearly sales figure of a shoe manufacturing company.



(i) What were the sales in 2000?
(ii) In which year the sales were maximum?
(iii) What is the difference between the sales in the year 2003 and 2005?

14. Draw a linear graph for the following data:

Month	May	June	July	August
Rainfall. (in cm)	5	7	4	6

15. Plot the points on a graph: A(4. 9); B(6, 0); C(7, 7); D(2, 4)
16. Plot the points A(4, 3). B(4, 0), (4, 2), (4, 6) and join them. Do they lie on the same line?

PLAYING WITH NUMBERS
SECTION A (One mark)

1. If M is a number such that M ÷ 5 gives a remainder of 1, then which of the following is the one's digit of M?
(i) 1 (ii) 6 (iii) 1 or 6 (iv) none of these.
2. A number divisible by 9 is also divisible by:
(i) 3 (ii) 6 (iii) 11 (iv) none of these.
3. If [3X 74] is a number divisible by 9, then the least value of X is:
(i) 1 (ii) 2 (iii) 3 (iv) 4
4. If [1X 2Y 6Z] is a number divigible by 9, then the least value of X + Y + Z is:
(i) 0 (ii) 1 (iii) 6 (iv) 9
5. The number 2 8 2 2 1 is divisible by which of the following:
(i) 2 (ii) 3 (iii) 6 (iv) 9
6. Which of the following is one's digit of a number, when divided by 5 gives a remainder of 3?
(i) 8 (ii) 3 (iii) 3 or 8 (iv) none of these.
7. If the 4-digit number 2X Y7 is exactly divisible by 3, then which of the following is the least value of (X + Y)?
(i) 3 (ii) 4 (iii) 6 (iv) 6
8. If a number is divisible by 2, then which of the following cannot be a one's digit in it?
(i) 0 (ii) 1 (iii) 2 (iv) 4
9. If a number is divisible by 5, then which of the following can be its one's digit?
(i) 2 (ii) 3 (iii) 4 (iv) 5
10. If a number is divisible by 10, then which of the following can be its one's digit?
(i) 0 (ii) 1 (iii) 3 (iv) 5
5. The usual form of the number 9 × 100 + 7 × 1
(a) 97 (b) 9007 (c) 907 (d) 16
6. A is a digit and 3A15 is a multiple of 9. Which of the following can be the value of A?
(a) 1 or 9 (b) 0 or 8 (c) 0 or 7 (d) 0 or 9
7. The value of A and B in $\begin{array}{r} 4A \\ +15 \\ \hline B2 \end{array}$ is:

(a) A = 7, B = 6 (b) A = 7, B = 7 (c) A = 7, B = 5 (d) A = 7, B = 4

8. The value of A and B in $\begin{array}{r} A1 \\ +1B \\ \hline B0 \end{array}$ is:

(a) A = 9, B = 9 (b) A = 7, B = 9 (c) A = 7, B = 7 (d) A = 9, B = 7

SECTION B(Three marks)

1. Check the divisibility by 21436587 by 9.
2. Check the disibility of 152875 by 9.
3. If the three digit number 24x is divisible by 9, what is the value of x?
4. Check the divisibility of 2146587 by 3.
5. Check the divisibility of 15287 by 3.
6. If 51x3 is a multiple of 9, where x is a digits, then what is the value of x?

7 If 27x is a multiple of 3 and x is a digit then find the value of x.

8. Write the following in the generalized form:

(i) 65 (ii) 605

9. Write the following numbers in usual form:

10 Is 307 divisibly by 9?

11. If 42x5 is a multiple of 9 and x is a digit, then find the value of x.
12. Is 10011 divisibly by 3?
13. If 3x12 is a multiple of 3 and x is digit, then find the value of x.
14. If 35x is a multiple of 9 and x is digit, then find the value of x.