



Sunali's Classes

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IX MATHS FULL COURSE PAPER – SET 1

Time: 3 hours

Max. Marks: 80

Instructions

1. This question paper contains two parts A and B.
2. Both Part A and Part B have internal choices.

PART-A

1. It consists of two sections- Section I and Section II.
2. Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.
3. Section II has 4 questions on case study. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.

PART-B

1. Question No. 21 to 26 are Very Short Answer Type questions of 2 marks each.
2. Question No. 27 to 33 are Short Answer Type questions of 3 marks each.
3. Question No. 34 to 36 are Long Answer Type questions of 5 marks each.
4. Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 5 marks.

PART A Section-I

Directions (Q. Nos. 1-16) Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.

1. If $a = 2$ and $b = 3$, then find the value of $\left(\frac{1}{a} + \frac{1}{b}\right)^a$.
2. If $x = \frac{5}{2}$ is a zero of the polynomial $2x^2 - kx - 12$, then find the value of k .
3. The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent this statement.

OR

If $(4, 19)$ is a solution of the equation $y = ax + 3$, then find the value of a .

4. If b denote the base and p be the perpendicular of right triangle, then find the area of the triangle.
5. The number of occurrence of an observation is known as _____.
6. Write the abscissa and ordinate of the origin.
7. Write the point on X-axis from where graph of linear equation $2x = 1 - 7y$ will pass.

OR

If $\frac{x}{y} + \frac{y}{x} = -1$ ($x, y \neq 0$), then find the value of $x^3 - y^3$.

8. Find the height of a cone whose diameter is 30 m and slant height is 25 m.
9. Write the name of the polynomial of degree two.

OR

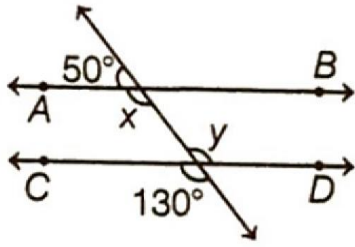
Write the degree of biquadratic polynomial.

10. If two complementary angles are such that one angle is $1\frac{1}{2}$ times the other, then find the smaller angle among them.
11. If the angles of a triangle are in the ratio $3 : 4 : 5$, then find the largest angle.
12. In a ΔABC , if $2\angle A = 3\angle B = 6\angle C$, then find the values of $\angle A$, $\angle B$ and $\angle C$.
13. Find the total surface area of a cone whose radius is $\frac{r}{2}$ and slant height is $2l$.

14. In a parallelogram ABCD, $\angle D = 115^\circ$ find the measure of $\angle A$.

OR

In the given figure, find the values of x and y .



15. Three coins are tossed simultaneously 400 times and following frequencies of the outcomes were recorded

Outcomes	Frequency
3 heads	103
2 heads	124
1 head	98
No head	x

Find the probability of getting no head.

OR

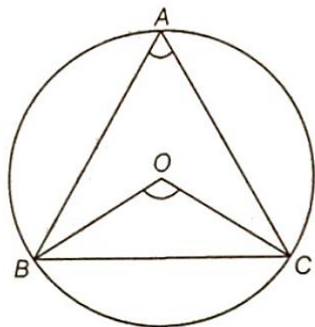
A coin is tossed 500 times with the following frequencies of two outcomes. Head: 240 times, tail: 260 times. Find the probability of occurrence of Head.

16. Find range of the following data: 70, 68, 49, 12, 15, 20, 50.

Section-II

Directions (Q. Nos. 17-20) Case study based questions are compulsory. Attempt any four sub-parts of each question. Each sub-part carries 1 mark.

17. Government of India is working regularly for the growth of handicapped persons. For this, three STD booths situated at A, B and C as shown in the figure, which are operated by handicapped persons. These three booths are equidistant from each other as shown in the figure.



(i) Which type of $\triangle ABC$ is the given figure?

- a) Equilateral triangle
- b) Isosceles triangle
- c) Right angled triangle
- d) Scalene Triangle

(ii) Measure of $\angle ABC$ is

- a) 45°
- b) 60°
- c) 30°
- d) 90°



- (iii) If $AB = 6 \text{ cm}$, then value of $BC + CA$ is
- 10
 - 12
 - 14
 - 16
- (iv) Measure of $\angle BOC$ is
- 90°
 - 100°
 - 120°
 - 50°
- (v) Value of $(\angle OBC + \angle OCB)$ is
- 60°
 - 30°
 - 45°
 - 90°

18. Charity is the act of giving help to those in need of it. It is a humanitarian act. So in this order, Radha distributed chocolates in an orphanage on her birthday, she gave 5 chocolates to each child and 20 chocolates to adults. Taking number of children as x and total chocolates distributed as y .

- (i) Write a linear equation, according to the given question.
- $y = 20x + 5$
 - $x = 20y + 5$
 - $y = 5x + 20$
 - $y = 20x + 10$
- (ii) If she distributed 145 chocolates, then how many children are there in the orphanage?
- 20
 - 25
 - 30
 - 35
- (iii) If she distributed 205 chocolates, then how many children are there in the orphanage?
- 36
 - 37
 - 39
 - 41
- (iv) If there are 20 children, then find the required number of chocolates.
- 70
 - 90
 - 120
 - 75
- (v) If there are 27 children, then find the required number of chocolates.
- 135
 - 145
 - 155
 - 165

19. Uttar Pradesh Government conducted a survey of 200 people was about their preference of visiting various pavilions:

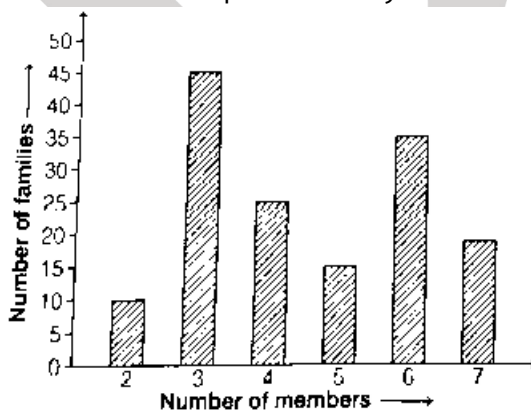
Pavilion	Good Living	Western Pavilion	Delhi Pavilion	Toy Pavilion	Defence Pavilion
Number of people	55	40	45	35	25

- (i) Find the probability that selected person visited only Western pavilion is
- $\frac{1}{5}$
 - $\frac{1}{10}$
 - $\frac{1}{15}$
 - $\frac{1}{20}$



- (ii) Find the probability that selected person visited both Good living and Delhi pavilion is
- $\frac{7}{10}$
 - $\frac{1}{2}$
 - $\frac{1}{3}$
 - $\frac{1}{4}$
- (iii) Find the probability that selected person visited only defense pavilion is
- $\frac{1}{7}$
 - $\frac{1}{8}$
 - $\frac{1}{9}$
 - $\frac{1}{10}$
- (iv) Find the probability that selected person visited only Delhi pavilion is
- $\frac{7}{40}$
 - $\frac{9}{40}$
 - $\frac{11}{40}$
 - $\frac{13}{40}$
- (v) Find the probability that selected person visited both Toy and Defense pavilion is
- $\frac{1}{10}$
 - $\frac{3}{10}$
 - $\frac{4}{10}$
 - $\frac{7}{10}$

20. Rajasthan government conduct a survey of 150 families of a town, the number of members in each family was recorded and the data has been represented by the following bar graph.



- (i) What does bar graph give?
- number of member
 - number of families
 - number of town
 - town population
- (ii) How many families have 2 members each?
- 5
 - 10
 - 30
 - 45
- (iii) How many families have 6 members?
- 30
 - 35
 - 45
 - 25
- (iv) How many people live alone?
- 0
 - 1
 - 2
 - 3



- (v) Which type of family is most common?
 (a) 3 members (b) 4 members
 (c) 5 members (d) 6 members

PART B

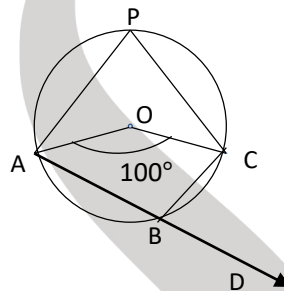
Directions (Q. Nos. 21-26): These are Very Short Answer Type questions of 2 marks each.

21. ABC is an equilateral triangle and L, M and N are the mid-points of the sides AB, BC and CA, respectively. Prove that $\triangle LMN$ is an equilateral triangle.
 22. If each side of a cube is tripled, then find its volume.

OR

If the circumference of the base of a cone is 44 cm and its height is 25 cm, then find the volume of the cone.

23. In given figure, O is centre of the circle. Find $\angle CBD$.



24. Construct a $\triangle ABC$ in which $AB = 5\text{ cm}$, $\angle A = 45^\circ$ and $\angle B = 60^\circ$.
 25. If a and b are rational numbers and $\frac{\sqrt{11}-\sqrt{7}}{\sqrt{11}+\sqrt{7}} = a - b\sqrt{77}$, then find the values of a and b .

OR

If $216^x = \frac{36}{6^x}$, then find the value of x .

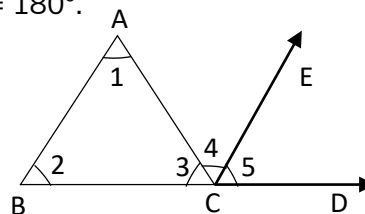
26. A cylindrical road roller made of iron is 1 m long. Its inner diameter is 54 cm and thickness of the iron sheet rolled into the road roller is 9 cm. Find the weight of the roller, if 1 cm^3 of iron weighs 8 gm.

Directions (Q. Nos. 27-33): These are Short Answer Type questions of 3 marks each.

27. Construct the angle of 15° . Do you think that the angle of $7\frac{1}{2}^\circ$ can be constructed by the bisector of 15° ?
 28. Plot the points (x, y) given in the following table on the plane choosing suitable units of distances on the axes.

x	-3	0	1	8	6	3	-7	-4
y	4	-2.5	3	-2	5	-4	-3.5	0

29. In the given figure, side BC of $\triangle ABC$ is produced to form ray BD and $CE \parallel BA$. Show that $\angle ACD = \angle A + \angle B$. Deduce that $\angle A + \angle B + \angle C = 180^\circ$.



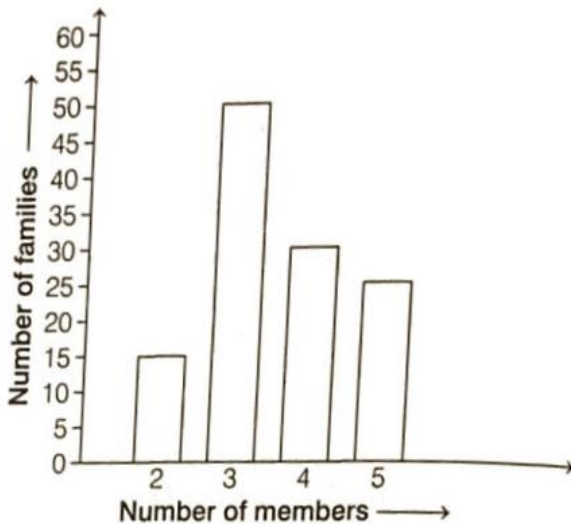
30. The relative humidity (in %) of a certain city for a month of 30 days was as follows:

98.1	98.6	99.2	90.3	86.5	95.2	92.9	96.3	94.2	95.1
89.2	92.3	97.1	93.5	92.7	95.1	97.2	93.3	95.2	97.3
96.2	92.1	84.9	90.2	95.7	98.3	97.3	96.1	92.1	89.0

- Construct a grouped frequency distribution table with classes 84 – 86, 86 – 88 etc.
- Which month or season do you think this data is about?
- What is the range of this data?

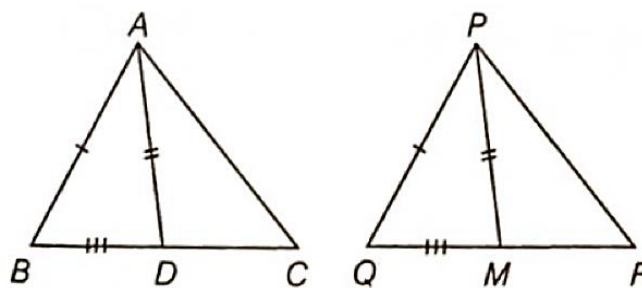
OR

In a survey of 120 families of a colony, the number of members in each family was recorded and the data has been represented by the following bar graph.



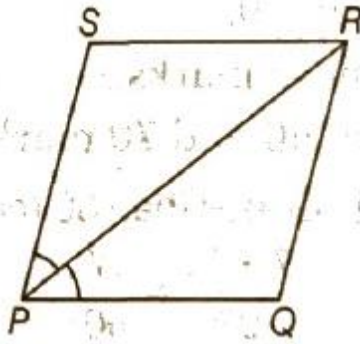
Read the bar graph carefully and answer the following questions:

- What information does the bar graph give?
 - How many families have 3 members?
 - How many people live alone?
31. ABCD is a cyclic quadrilateral, whose diagonals intersect at a point E. If $\angle DBC = 80^\circ$ and $\angle BAC = 40^\circ$, then find $\angle BCD$. Further, if $AB = BC$, then find $\angle ECD$.
32. In the given figures, two sides AB, BC and the median AD of $\triangle ABC$ are correspondingly equal to the sides PQ, QR and the median PM of $\triangle PQR$. Prove that $\triangle ABC \cong \triangle PQR$.



OR

Diagonal PR of a parallelogram PQRS bisects $\angle P$ (see the figure).



Show that

- i. It bisects $\angle R$ also.
 - ii. PQRS is a rhombus.
33. ABCD is a cyclic quadrilateral whose diagonals intersect at a point E. If $\angle DBC = 70^\circ$ and $\angle BAC = 30^\circ$, then find $\angle BCD$. Further, if $AB = BC$, find $\angle ECD$.

Directions (Q. Nos. 34-36): These are Long Answer Type questions of 5 marks each.

34. Simplify: $\frac{1}{1+\sqrt{3}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \dots + \frac{1}{\sqrt{8}+\sqrt{9}}$

OR

If $a = \frac{3^{x-2}}{3^{x-5}}$, $b = \frac{3^x}{3^{-x-2}}$ and $a - b = 0$, find the value of x .

35. The area of the curved surface of a right circular cylinder is 4400 cm^2 and the circumference of its base is 110 cm . Find the height and volume of the cylinder. (take, $\pi = \frac{22}{7}$)
36. Two years later, a father will be 8 years more than three times the age of his son. Taking the present ages of father and son as x and y , respectively, write a linear equation for the above and draw its graph. From the graph, find the age of the father, when the son's age is 10 years.

