CBSE Class 9 Maths Sample Paper Set 10

SUBJECT: MATHEMATICS
CLASS : IX

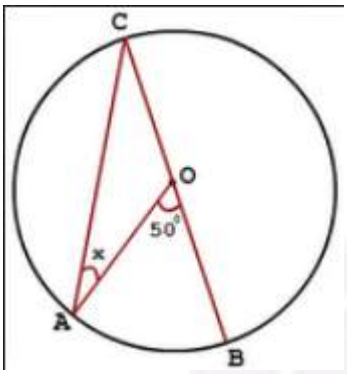
MAX. MARKS : 80
DURATION : 3 HRS

General Instruction:

(i) **All** questions are compulsory.
(ii) This question paper contains **28** questions divided into four Sections A, B, C and D.
(iii) **Section A** comprises of 4 questions of **1 mark** each. **Section B** comprises of 6 questions of **2 marks** each. **Section C** comprises of 8 questions of **3 marks** each and **Section D** comprises of 10 questions of **4 marks** each.
(iv) Use of Calculators is not permitted

Section A: Each question carries 1 mark

1. Consider the first 7 multiples of 6. Find their mean.
2. For the data given below, find the median. The weight in grams of bars of chocolates is as follows:
   137, 145, 122, 153, 118, 159, 164, 111
3. Find the measure of angle x in the following figure given that the centre of the circle is O and BC is the diameter.



4. A cone has a base diameter of 14 cm and a slant height of 25 cm. Find its height.

Section B: Each question carries 2 marks

1. A circle is circumscribed about an equilateral triangle of side length 18cm. Find the radius of the circle.
2. MB and NB are the bisectors of angles M and N respectively of the quadrilateral LMNP. Prove that measure of angle MBN is equal to half the sum of the angles L and P.
3. Given that two chords of a circle are parallel, then prove that if a diameter of the circle bisects one chord, it also bisects the other chord.
4. A sphere is made by reshaping a solid right circular cone of height 14 cm and diameter 10 cm. Find the radius of the sphere thus formed.
5. The number of girl child per family was recorded for 1000 families with 3 children. The data obtained was as follows:

Number of girls	0	1	2	3
Number of families	112	314	382	192

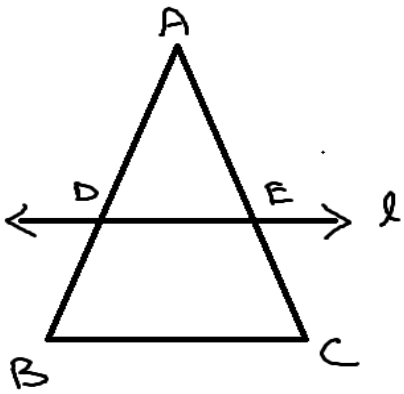
Suppose a family is chosen at random, find the probability that it has:

a. At most one girl
b. More girls than boys

6. In a certain city, out of 30 days of the month, it rains on 8 days. Find the probability that on a given day selected, it does not rain.

Section C: Each question carries 3 marks

1. A random variable has values $x_1, x_2, x_3, \ldots, x_n$ such that $\sum_{i=1}^{n}(x_i - 3) = 126$ and $\sum_{i=1}^{n}(x_i - 7) = 50$. Find the value of n and the mean.
2. The average Olympiad score of 10 students who are selected to represent the school for a Math quiz is 85. If one more student whose score is 88 is added to this group of 10 students, then now what is the average score of this group of 11 students?
3. Derive the formula for area of an equilateral triangle of side 'a' in terms of the side of length only.
4. In the following figure the triangle ABC is an isosceles triangle. Line l is parallel to the base BC. Prove that the quadrilateral DBCE is cyclic.



5. Write a proof for the theorem: The diagonals of a rhombus are perpendicular bisectors of each other.

6. Define the following terms with supporting diagrams:
   a. Intersecting lines
   b. Ray
   c. Concurrent lines
   d. Parallel lines
   e. Collinear points
   f. Line segment

7. Prove that the value of the following expression equals $\frac{16}{3}$

$$\left(\frac{1}{4}\right)^{-2} - 3 \times 8^{\frac{2}{3}} \times 4^{0} + \left(\frac{9}{16}\right)^{-\frac{1}{2}}$$

8. A conical tent has to be painted from the outside. The rate of painting is Rs. 150/- per square feet. If the radius of the base of the tent is 7 feet and the slant height of the tent is 8 feet, find the total cost of painting the tent.

Section D: Each question carries 4 marks

1. Mr. Mehra's field is in the shape of an irregular quadrilateral. The sides taken in clockwise direction measure 26 m, 27 m, 7 m and 24 m. The two sides measuring 7 m and 24 m form a right angle. Find the area of the field.
2. The topics for a science project chosen by 40 students of a class are distributed as per the frequency distribution table given below. Use the data to construct a bar graph and answer the questions that follow:

Rain water harvesting	5
Global warming	8
Modern world communication	14
Solar energy	7
Afforestation	6

   a. What percent of the class would represent the students who have done a project on global warming?
   b. Find the relative frequency of the students who have done the project on modern world communication.

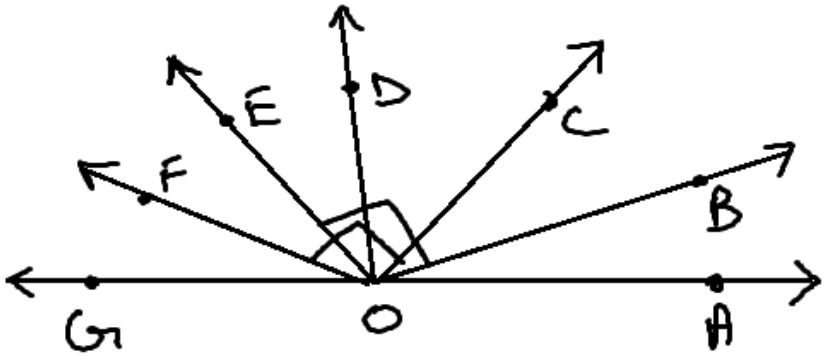
3. Rationalize the denominator in the following radical expressions:

   a. $\frac{5-3\sqrt{3}}{5+3\sqrt{3}}$

   b. $\frac{m^2}{\sqrt{m^2+n^2}+m}$

4. The volume of a cuboid is represented by the expression: $x^3 + 4x^2 - 9x - 36$. Find the possible dimensions of the length, width and height of the cuboid and then use those dimensions to find the surface area of the same cuboid.

5. In the following figure the angles AOD and DOG form a linear pair. The angles EOB and FOC are right angles. The angles DOC, FOG and AOB all measure 30 degrees each. Find the measures of the angles FOE, COB, DOE and DOG.



6. In the following figure KLMN is a square and OLM is an equilateral triangle. (i) Prove that the triangle OKN is an isosceles triangle and (ii) that the measure of angle TQR is 15 degrees.

7. Two points of a parallelogram are (1,2) and (2,5). The base of the parallelogram is parallel to the x axis and is 4 units long. Find the co-ordinates of the other two points of this parallelogram and also find the length of the other pair of parallel sides of the parallelogram. What would the area of this parallelogram be?

8. Sunaina tells her son Ambar that seven years ago she was 7 times older than him then and 3 years from now she will be three times as old as him then. Consider that Sunaina is x years old and Ambar is y years old today, sketch a graph representing this situation and also find the present ages of Sunaina and Ambar.

9. Construct the following: A circle with centre C and two chords of the circle MN and OP such that they are not parallel to each other. Construct perpendicular bisectors of the chords using a straight edge and compass only. Mark the point at which the perpendicular bisectors intersect. What is that point called? (Note: List out the steps done for this construction)

10. In the context of statistics explain what the following terms mean: (a) Class – interval (b) Class – size (c) Class – mark and (d) Class limits. Give examples also.