CBSE
Class IX Mathematics
Term II
Sample Paper - 7

Time: 3½ hrs **Total Marks: 90**

General Instructions:

1. **All** questions are **compulsory**.
2. The question paper consists of **34** questions divided into **four sections** A, B, C, and D. **Section A** comprises of **8** questions of 1 mark each, **Section B** comprises of **6** questions of 2 marks each, **Section C** comprises of **10** questions of 3 marks each and **Section D** comprises of **10** questions of 4 marks each.
3. Question numbers **1 to 8** in **Section A** are multiple choice questions where you are to select **one** correct option out of the given four.
4. There is no overall choice. However, internal choice has been provided in 2 questions of **three marks** each and **2** questions of **four marks** each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculator is **not** permitted.

(SECTION – A)

1. Mode of the data set 3, 2, 5, 2, 3, 5, 6, 6, 5, 3, 5, 2, 5 is:

(A) 3
(B) 4
(C) 6
(D) 5

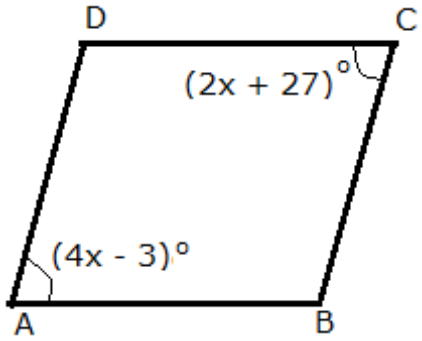
2. A cylinder of base radius 'R' and height h is dipped vertically to half the height, a bucket full of yellow paint. Then find the area of the surface gets painted.

(A) $\frac{1}{2}\pi R^2 h$
(B) $\frac{1}{3}\pi R^2 h$
(C) πRh
(D) $\pi R(h+R)$

3. The surface area of a sphere is same as the curved surface area of a right circular cylinder whose height and diameter are 12 cm each. The radius of the sphere is:

(A) 5 cm
(B) 4 cm
(C) 6 cm
(D) 7 cm

4. In the following figure ABCD is a parallelogram, find the value of 'x'



(A) 10°
(B) 15°
(C) 20°
(D) 25°

5. ABCD is a parallelogram. OA and OB are the angle bisectors of the consecutive angles, then m∠AOB =
(A) 45°
(B) 60°
(C) 90°
(D) 30°

6. The speed x of train A is twice the speed y of the train B. Express this in the form of a linear equation.
(A) 2x = y
(B) x = 2y
(C) $x = \frac{y}{2}$
(D) x = y

7. The median of a triangle divides it into two
(A) triangles of equal area
(B) congruent triangles
(C) right triangles
(D) isosceles triangles

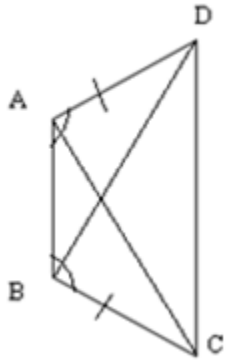
8. Which of the following is true?
(A) A circle has only one diameter
(B) The circumference of a circle is divided into equal areas, each is a major arc
(C) A sector is region which lies between an arc and two radii joining the extremities of the arc and the centre
(D) Line segment joining the centre of any point of the circle is a radius of the circle.

(SECTION – B)

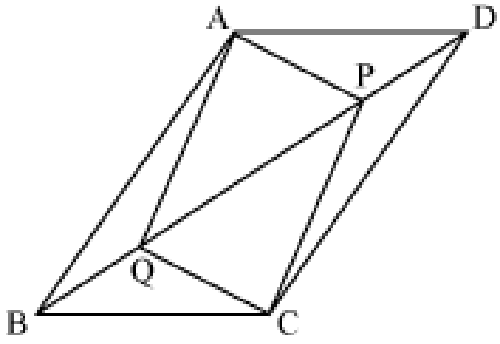
9. How many litres of water flow out through a pipe having 5 cm^2 area of cross section in one minute, if the speed of water in the pipe is 30 cm/sec?

10. When a thumbtack is tossed, there are two possible outcomes. If the empirical probability of 'point up' is fixed to be 0.73, what should be the probability of 'point down'? .

11. In the given figure, ABCD is a quadrilateral in which AD = BC and ∠DAB = ∠CBA Prove that (a) ΔABD ≅ ΔBAC (b) BD = AC



12. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ (see the given figure). Show that (i) ΔAPD ≅ ΔCQB (ii) AP = CQ

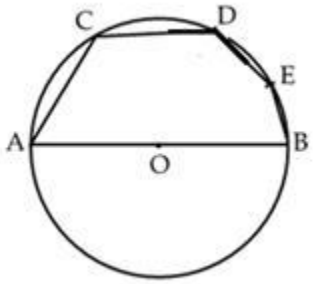


13. Draw a line segment of length 10 cm and bisect it. Further bisect one of the equal parts and measure its length.

14. Two angles are complementary. The larger angle is 3° less than twice the measure of the smaller angle. Find the measure of each angle.

(SECTION – C)

15. AOB is the diameter of a circle and C, D, and E are any three points on the circle on the same side of AOB. Find the value of m∠ACD + m∠BED.



16. A survey was undertaken in 30 classes at a school to find the total number of left-handed students in each class. The table below shows the results:

No. of left-handed students	0	1	2	3	4	5
Frequency (no. of classes)	1	2	5	12	8	2

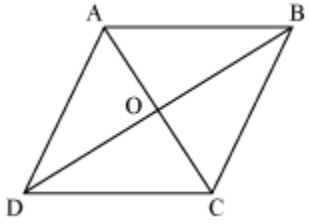
A class was selected at random.

(a) Find the probability that the class has 2 left-handed students.

(b) What is the probability that the class has at least 3 left-handed students?

(c) Given that the total number of students in the 30 classes is 960, find the probability that a student randomly chosen from these 30 classes is left-handed

17. Show that if the diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus .



18. The radius and height of a right circular cone are in the ratio 4 : 3 and its volume is 2156 cm^3 Find the curved surface are of the cone.

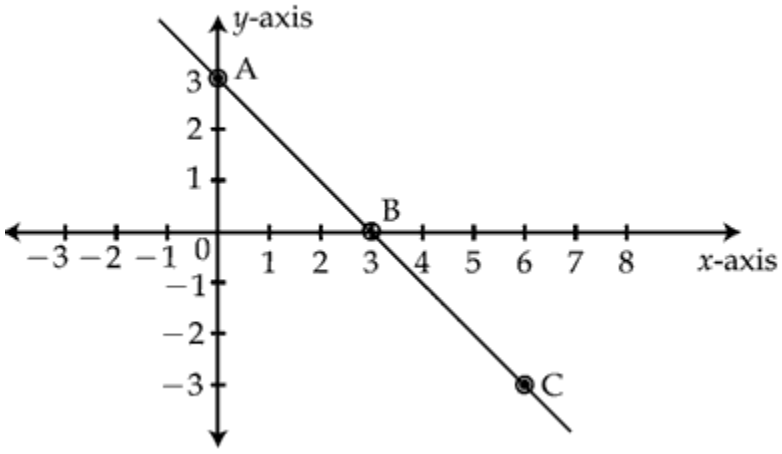
19. Solve:

$$x-\frac{2}{3}y=\frac{8}{3}, \frac{2x}{5}-y=\frac{7}{5}$$

OR

Observe the graph and answer the following questions:

i. Write the co-ordinates of points B and C.
ii. Find one more solution of the line passing through A and B.
iii. Write equations of the x-axis and y-axis.



20. The distance (in km) of 40 engineers from their residence to place of work were found as follows:

5	3	10	20	25	11	13	7	12	31
2	19	10	12	17	18	11	32	17	16
3	7	9	7	8	3	5	12	15	18
12	12	14	2	9	6	15	15	7	6

Construct a grouped frequency distribution table with class size 5 for the data given above taking the first interval as 0 - 5 (5 not included). What main feature do you observe from this tabular representation?

21. The slant height and base diameter of a conical tomb are 25 m and 14 m respectively. Find the cost of white-washing its curved surface at the rate of Rs. 210 per 100 m^2.

22. The angles of a quadrilateral are in the ratio 3 : 5 : 9 : 13. Find all the angles of the quadrilateral.

OR

Show that the diagonals of a square are equal and bisect each other at right angles.

23. We know that two circles are congruent if they have the same radii, hence prove that equal chords of congruent circles subtend equal angles at their centres.

24. Rahim takes out all hearts from a pack of cards. What is the probability of

i. Picking out a diamonds.
ii. Picking out a card that is not a heart.
iii. Picking out the ace of hearts.

(SECTION – D)

25. Construct a right triangle whose base is 12 cm and sum of its hypotenuse and other side is 18 cm.

26. Construct ΔABC in which m∠B = 60°, m∠C = 45° and the perimeter of the triangle is 11 cm.

27. The students of a Vidyalaya were asked to participate in a competition for making and decorating penholders in the shape of a cylinder with a base, using cardboard. Each penholder was to be of radius 3 cm and height 10.5 cm. The Vidyalaya was to supply the competitors with cardboard. If there were 35 competitors, how much cardboard was required to be bought for the competition?

28. In a study of diabetic patients in a village, the following observations were noted.

Age in years	10-20	20-30	30-40	40-50	50-60	60-70
Number of patients	2	5	12	19	9	4

Represent the above data by a frequency polygon

29. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units. Also from the graph determine the work done when the distance travelled by the body is

i. 2 units ii. 0 units

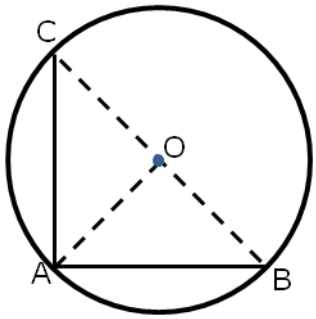
OR

Two years later a father will be eight years more than three times the age of the son. Taking the present age of father and son as x and y respectively,

(a) Write a linear equation for the above and draw its graph.

(b) From the graph find the age of the father when the son's age is 10 years.

30. In the given figure, AB and AC are two equal chords of a circle with centre O. Show that O lies on the bisectors of ∠BAC.



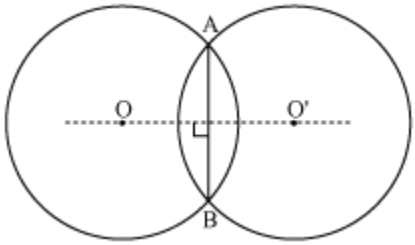
31. The front compound wall of a house is decorated by wooden spheres of diameter 21 cm, placed on small supports as shown in the given figure. Eight such spheres are used for this purpose and are to be painted silver. Each support is a cylinder of radius 1.5 cm and height 7 cm and is to be painted black. Find the cost of paint required if silver paint costs 25 paise per cm^2 and black paint costs 5 paise per cm^2.

OR

A solid cylinder has a total surface area of 462 sq cm. Its curved surface area is one third of the total surface area. Find the volume of the cylinder.

32. A wall of length 20 m was to be built across an open ground. The height of the wall is 9 m and the thickness of the wall is 24 cm . if this wall is to be built up with the bricks whose dimensions are 18 cm × 10 cm × 6 cm; how many bricks would be required?

33. If two circles intersect at two points, prove that their centres lie on the perpendicular bisector of the common chord.



34. (i) The marks obtained by 40 students of class IX in Mathematics are given below:

81, 55, 68, 79, 85, 43, 29, 68, 54, 73, 47, 35, 72, 64, 95, 44, 50, 77, 64, 35, 79, 52, 45, 54, 70, 83, 62, 64, 72, 92, 84, 76, 63, 43, 54, 38, 73, 68, 52, 54

Prepare a grouped continuous frequency distribution table with class-size of 10 marks.

(ii) The blood groups of 30 students of Class VII are recorded as follows:

A, B, O, O, AB, O, A, O, B, A, O, B, A, O, O, A, AB, O, A, A, O, O, AB, B, A, O, B, A, B, O

Represent this data in the form of a frequency distribution table. Which is the most common, and which is the rarest blood group among these students?