

CBSE
Class IX Mathematics
Term II
Sample Paper - 2

Time: 3½ hrs

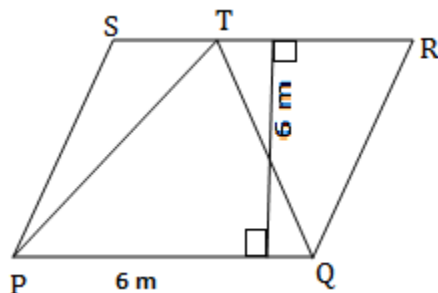
Total Marks: 90

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. Two solutions for the equation $2x + y = 1$ are
 (A) (0, 1) and (1, 0)
 (B) (0, 1) and (1/2, 0)
 (C) (2, 0) and (1, 2)
 (D) (2, 3) and (4, 5)
2. In the given figure, PQRS is a parallelogram, then area(Δ PQT) is



- (A) 12 m^2
 (B) 18 m^2
 (C) 6 m^2
 (D) 24 m^2
3. A line l intersects two concentric circles at P, Q, R and S. Then
 (A) $PQ = RS$
 (B) $PS \times RS = PS \times PQ$
 (C) $TS = PR$
 (D) $PQ > RS$

4. A frequency distribution has class intervals 0 – 10, 10 – 20, 20 – 30, and so on. In such a distribution 20 would be considered to belong to which class?
- (A) 10 – 20
(B) 11 – 20
(C) 20 – 30
(D) 21 – 30
5. The relation between the surface area of a sphere and lateral surface area of a right circular cylinder that just encloses the sphere is
- (A) Surface area of the sphere is equal to the lateral surface area of the right circular cylinder.
(B) Surface area of the sphere is less than the lateral surface of the right circular cylinder.
(C) Surface area of the sphere is greater than the lateral surface area of the right circular cylinder.
(D) Lateral surface area of the sphere is less than the surface of the right circular cylinder.
6. A conical tank is 6 m deep and its circular top has a radius 1.4 m. Find the capacity of the tank.
- (A) 86.25 m^3
(B) 12.32 m^3
(C) 8.8 m^3
(D) 52.8 m^3
7. Choose the correct statement
- (A) Every parallelogram is a rhombus
(B) Every parallelogram is a trapezium
(C) Every parallelogram is a rectangle
(D) Every rectangle is a square
8. The area of a rhombus, the lengths of whose diagonals are 16 cm and 24 cm, is
- (A) 150 cm^2
(B) 192 cm^2
(C) 384 cm^2
(D) 40 cm^2

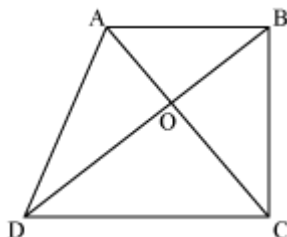
(SECTION – B)

9. A rectangular sheet of card paper, 44 cm × 20 cm in size, is rolled along its length

and a cylinder is formed. Find the volume of the cylinder.

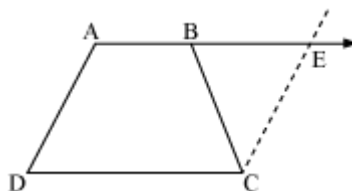
- 10.** Diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at O.

Prove that $\text{area}(\triangle AOD) = \text{area}(\triangle BOC)$.



- 11.** What is the sum of the probabilities of the happening and not happening of an event?

- 12.** ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$ (see the given figure). Show that $\angle A = \angle B$.



- 13.** In countries like the USA and Canada, temperature is measured in Fahrenheit, whereas in countries like India it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius:

$$F = \left(\frac{9}{5}\right)C + 32$$

- If the temperature is 30°C , what is the temperature in Fahrenheit?
- If the temperature is 95°F , what is the temperature in Celsius?

- 14.** Bisect a line segment of length 5.8cm.

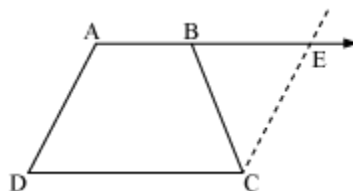
(SECTION – C)

- 15.** Show that the diagonals of a rhombus are perpendicular to each other.

OR

ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$ (see the given figure). Show that

- $\angle A = \angle B$
- $\angle C = \angle D$
- $\triangle ABC \cong \triangle BAD$
- Diagonal $AC =$ Diagonal BD



- 16.** Parveen wanted to make a temporary shelter for her car, by making a box-like structure with tarpaulin that covers all the four sides and the top of the car (with the front face as a flap which can be rolled up). Assuming that the stitching margins are very small, and therefore negligible, how much tarpaulin would be required to make the shelter of height 2.5 m, with base dimensions 4 m \times 3 m?

- 17.** If the mean of the following frequency distribution is 8, find the value of p.

X	3	5	7	9	11	13
F	6	8	15	P	8	4

- 18.** The distance (in km) from the residence to place of work of 40 engineers was found to be as follows:

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

What is the empirical probability that an engineer lives:

- less than 7 km from his/ her place of work?
- more than or equal to 7 km from his/ her place of work?
- within $\frac{1}{2}$ km from his/ her place of work?

- 19.** Find two solutions for each of the following equations:

- $4x + 3y = 12$
- $2x + 5y = 0$
- $3y + 4 = 0$

OR

Yamini and Fatima, two students of Class IX of a school, together contributed Rs. 100 towards the Prime Minister's Relief Fund to help earthquake victims. Give a linear equation which satisfies this data. (You may take their contributions as Rs. x and Rs. y .) Draw the graph of the same.

- 20.** A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter being 4.4 cm. Find its
- Inner curved surface area,
 - Outer curved surface area,
 - Total surface area.
- 21.** Show that if the diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus.
- 22.** An organisation selected 2400 families at random and surveyed them to determine a relationship between the income level and the number of vehicles in a family. The information gathered is listed in the table below:

Monthly income (in Rs)	Vehicles per family			
	0	1	2	Above 2
Less than 7000	10	160	25	0
7000 – 10000	0	305	27	2
10000 – 13000	1	535	29	1
13000 – 16000	2	469	59	25
16000 or more	1	579	82	88

Number of families surveyed = 2400

Suppose a family is chosen, find the probability that the family chosen has

- Earnings between Rs. 10000 – Rs. 13000 per month and owns exactly 2 vehicles.
 - Earnings of Rs. 16000 or more per month and owns exactly 1 vehicle.
 - Earnings less than Rs. 7000 per month and does not own any vehicle.
- 23.** Recall that two circles are congruent if they have the same radii. Prove that equal chords of congruent circles subtend equal angles at their centres.
- 24.** Prove that the quadrilateral formed by the bisectors of internal angles of a cyclic quadrilateral is also cyclic.

(SECTION – D)

- 25.** Construct an angle of 90° at the initial point of a given ray and justify the construction.

OR

Construct an equilateral triangle of side 5 cm and justify the construction.

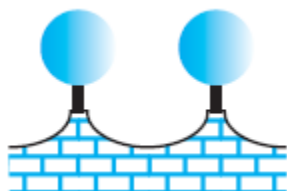
- 26.** Write four solutions for $2x + y = 7$.

OR

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 relationship 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 read from the graph the work done when the distance travelled by the body is

- i. 2 units
- ii. 0 units

- 27.** 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 .



- 28.** Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4 cm. Find the length of the common chord.
- 29.** The lengths of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at distance 4 cm from the centre, what is the distance of the other chord from the centre?
- 30.** A cubical box has edges each of 10 cm and another cuboidal box is 12.5 cm long, 10 cm wide and 8 cm high.
- i. Which box has the greater lateral surface area and by how much?
 - ii. Which box has the smaller total surface area and by how much?

31. Draw a frequency polygon for the following frequency distribution:

Class-interval	1-10	11-20	21-30	31-40	41-50	51-60
Frequency	8	3	6	12	2	7

32. Construct $\triangle ABC$ in which $BC = 8$ cm, $m\angle B = 45^\circ$ and $AB - AC = 3.5$ cm.

33. A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled cardboard. Each cone has a base diameter of 40 cm and height 1 m. If the outer side of each of the cones is to be painted and the cost of painting them is Rs. 12/ m^2 , what will be the cost of painting all these cones? (Use $\pi = 3.14$ and take $\sqrt{1.04} = 1.02$).

34. The number of patients attending a cardiac clinic and diabetic clinic in a hospital, in a month is given below:

Number of Patients	0-5	5-10	10-15	15-20	20-25	25-30
Diabetic Clinic	3	5	10	8	3	1
Cardiac Clinic	2	6	12	6	3	1

Compare the occurrence of diseases by plotting frequency polygon on same axes.