

SAMPLE PAPER, 2017-18

MATHEMATICS

CLASS - IX

Time: - 3 Hours

Maximum Marks: - 80

General Instructions:

1. All questions are compulsory.
2. The question paper consists of **30 questions** divided into four sections A, B, C and D.
3. **Section A** contains **6 questions** of **1 mark** each, **Section B** contains **6 questions** of **2 marks** each, **Section C** contains **10 questions** of **3 marks** each and **Section D** contains **8 questions** of **4 marks** each.
4. Use of calculators is not permitted.

SECTION – A

- Q. 1. How many rational numbers are there between $\sqrt{3}$ and $\sqrt{5}$?
- Q. 2. If we add two irrational numbers, then resulting number is always a rational number. Is it true?
- Q. 3. What is the degree of a constant polynomial?
- Q. 4. Write the formula of total surface area of cuboid.
- Q. 5. What is the class mark of the class interval 150 – 160?
- Q. 6. What is the class size of the class interval 150 – 160?

SECTION – B

- Q. 7. Write the statements of Remainder Theorem and Factor Theorem.
- Q. 8. Write the following equation in the form of $ax + by + c = 0$ and then write the values of a , b and c .
 $4 = 5x - 3y$.
- Q. 9. Write any two Euclid's axioms.
- Q. 10. If you draw two circles, then what is the maximum number of common points in them?
- Q. 11. A right circular cylinder just encloses a sphere of radius 'r'. Find
- (i) Surface area of the sphere,
 - (ii) Curved surface area of the cylinder.
- Q. 12. The record of a weather station shows that out of the past 250 consecutive days, its weather forecasts were correct 175 times.
- (i) What is the probability that on a given day it was correct?
 - (ii) What is the probability that it was not correct on a given day?

SECTION – C

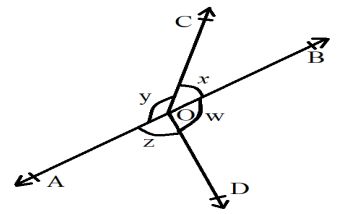
- Q. 13. Find the value of k , if $x - 1$ is a factor of $4x^3 + 3x^2 - 4x + k$.

OR

Evaluate 105×106 without multiplying directly.

- Q. 14. Find three different solutions of the equation $x + 2y = 6$.

- Q. 15.** In the given figure, if $x + y = w + z$, then prove that AOB is a line.



- Q. 16.** A square is inscribed in an isosceles right-angled triangle, so that the square and the triangle have one angle common. Show that the vertex of the square opposite the vertex of the common angle bisects the hypotenuse.

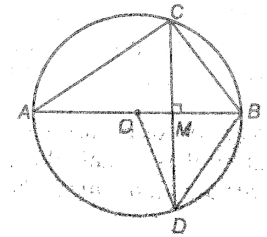
OR

ABCD is a rhombus in which $\angle A = 60^\circ$. Find the ratio $AC : BD$.

- Q. 17.** A quadrilateral ABCD is inscribed in a circle such that AB is a diameter and $\angle ADC = 130^\circ$. Find $\angle BAC$.

OR

In the following figure, O is the centre of the circle, $BD = OD$ and $CD \perp AB$. Find $\angle CAB$.



- Q. 18.** Construct a ΔABC in which $BC = 7$ cm, $\angle B = 75^\circ$ and $AB + AC = 13$ cm.

- Q. 19.** Find the area of a triangle, two sides of which are 8 cm, 11 cm and 13 cm.

- Q. 20.** Find the total surface area of a cone, if its slant height is 10 m and diameter of its base is 12 m.

OR

Find the total surface area of a hemisphere of radius 10 cm. (Use $\pi = 3.14$)

- Q. 21.** The following table gives the life times of 400 neon lamps:

Life time (in hours)	Number of lamps
300 – 400	14
400 – 500	56
500 – 600	60
600 – 700	86
700 – 800	74
800 – 900	62
900 – 1000	48

Represent the given information with the help of a histogram.

- Q. 22.** Find the mean salary of 60 workers of a factory from the following table:

Salary (in Rs.)	Number of workers
3000	16
4000	12
5000	10
6000	8
7000	6

8000	4
9000	3
10000	1
Total	60

SECTION – D

- Q. 23.** If a and b are rational numbers and $\frac{1}{2+\sqrt{3}} = a - b\sqrt{3}$, find the values of a and b .

OR

Express $0.6 + 0.\bar{7} + 0.4\bar{7}$ in the form of $\frac{p}{q}$, where p, q are integers and $q \neq 0$.

- Q. 24.** A property dealer offers a sale of plot of area $\{6x^2 - 10xy - 20y^2\}$ square units and area $\{(2x - 5y) \cdot (3x + 4y)\}$ square units to a customer. If $x = 3$ and $y = 1$ is taken, then which is better deal for customer? If dealer suggests to purchase the plot of area $\{(2x - 5y) \cdot (3x + 4y)\}$, which moral value is being depicted?

- Q. 25.** If a, b and c are all non-zero and $a + b + c = 0$, prove that

$$\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3.$$

OR

Factorise $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$.

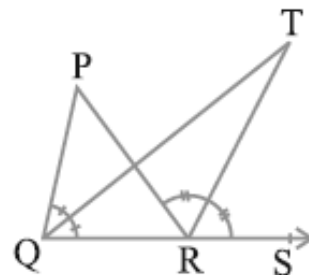
- Q. 26.** Plot the following points, join them in order and identify the figure, thus formed.

$$A(1, 3), B(1, -1), C(7, -1), D(7, 3)$$

Also, write the coordinates of the point of intersection of the diagonals.

- Q. 27.** In figure, the side QR of $\angle PQR$ is produced to a point S . If the bisectors of $\angle PQR$ and $\angle PRS$ meet at point T , then prove that

$$\angle QTR = \frac{1}{2} \angle QPR.$$



- Q. 28.** AD is an altitude of an isosceles triangle ABC in which $AB = AC$. Show that

- (i) AD bisects BC .
- (ii) AD bisects $\angle A$.

OR

Prove that the sum of three altitudes of a triangle is less than the sum of the three sides of the triangle.

- Q. 29.** $ABCD$ is a square. A is joined to a point P on BC and D is joined to a point Q on AB . If $AP = DQ$, then prove that AP and DQ are perpendicular to each other.

- Q. 30.** A rhombus shaped field has green grass for 18 cows to graze. If each side of the rhombus is 30 m and its longer diagonal is 48 m, how much area of grass field will each cow be getting?
