PRINCE PUBLIC SCHOOL
HALF YEARLY EXAMINATION (2019-20)
SAMPLE PAPER-2
MATHEMATICS
IX

TIME ALLOWED: 3 HOURS **MAXIMUM MARKS: 80**

General Instructions

1. **This question paper consists of 40 questions. All questions are compulsory.**
2. **Questions 1- 20 in Section- A are very short type questions carrying 1 mark each.**
3. **Questions 21- 26 in Section-B are short answer type questions carrying 2 marks each.**
4. **Question 27-34 in Section C are short answer type-II questions carrying 3 marks each.**
5. **Question 35-40 in Section D are long answer type questions carrying 4 marks each.**
6. **There is no overall choice.**
7. **Use of calculator is not allowed.**

SECTION- A

Q1. Simplify $\sqrt[12]{(x^4)^{\frac{1}{3}}}$.

Q2. Find the value of $p\left(-\frac{2}{3}\right)$ for $p(y) = 2y^3 - y^2 - 13y - 6$.

Q3. If x^2+kx+6 = (x+2)(x+3) for all x, then value of k is _____.

Q4. Angles of a triangle are in the ratio 3:4:5. Find the largest angle of the triangle.

Q5. A point whose abscissa is -3 and ordinate 2 lies in_____.

Q6. It is known that if $a = 2b$ and $c = 2b$, then $a = c$. Which Euclid's axiom illustrates this statement?

Q7. The product of $4\sqrt{6}$ and $3\sqrt{24}$ is _____.

Q8. Solve the equation y - 25 = 40 and state which axiom will you use here. _____

Q9. In a throw of a die, find the probability of not getting 4 or 5. _____

Q10. The sides of a triangle are 50cm, 78cm and 112cm. The smallest altitude is _____.

Q11. The base BC of an equilateral triangle ABC with side $BC = 2a$ lie along y-axis such that the mid point of the base is at origin. Find the coordinates of B and C.

Q12. There is a group of 75 people who are patriotic, 35 people believe in violence. What is the probability of people who believe in non- violence. _____

Q13. The value of $(249)^2$-$(248)^2$= _____.

Q14. The distance of the point $P(4,3)$ from the origin is _____

Q15. If a= -2 and b= -1 then a^{-b}- b^a= _____.

Q16. A bag contains 50 coins and each coin is marked from 51 to 100. One coin is picked at random. The probability that the number on the coin is not a prime number is_____.

Q17. If the ratio between two complementary angles is 2:3, then find the angles.

Q18. John is of the same age as Mohan. Ram is also of the same age as Mohan. State the Euclid's axiom that illustrates the relative ages of John and Ram. _____

Q19. During Van Mahotsav , some children planted trees in a triangular region, two sides of which are 18 m and 10 m and the perimeter is 42 m. Find the area of planted region.

Q20. In fig.1, if $AB \parallel CD$, then find the value of x.

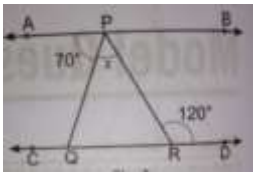

fig. 1

SECTION –B

Q21. The sides of a triangular field are 41 m, 40 m and 9 m. Find the number of rose beds that can be prepared in the field, if each rose bed on an average needs 900 cm^2 space.

Q22. If $x = 0.027$, then find $\left(\frac{1}{x}\right)^{\frac{1}{3}}$.

Q23. In fig.2, ABC is an equilateral triangle. The coordinates of vertices B and C are $(3, 0)$ and $(-3, 0)$ respectively. Find the coordinates of its vertex A.

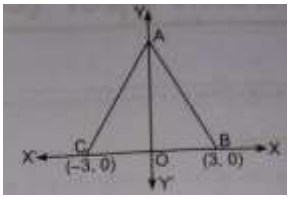

fig. 2

Q24. Find the coordinates of a point which

a) lies on x-axis and is at a distance of 3 units to the left of origin.

b) lies on y-axis and is at a distance of 5 units above origin.

Q25. If $x + 2k$ is a factor of $f(x) = x^5 - 4k^2x^3 + 2x + 2k + 3$, find k.

Q26. If the area of an equilateral triangle is $16\sqrt{3}\ cm^2$, then find the perimeter of the triangle.

SECTION –C

Q27. Simplify $\frac{\sqrt{25}}{\sqrt[3]{64}} + \left(\frac{256}{625}\right)^{-1/4} + \frac{1}{\left(\frac{64}{125}\right)^{2/3}}$.

OR

Simplify by rationalizing the denominator $\frac{4\sqrt{3} + 5\sqrt{2}}{\sqrt{48} + \sqrt{18}}$.

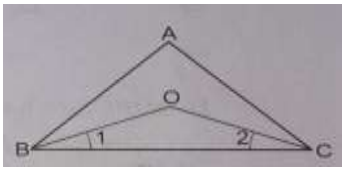

fig. 3

Q28. In fig. 3, if the bisector of angles $\angle B$ and $\angle C$ of a triangle ABC meet at a point O, then prove that

$\angle BOC = 90° + \frac{1}{2}\angle A$.

Q29. A field is in the shape of a trapezium whose parallel sides are 25 m and 10 m. The non – parallel sides are 14 m and 13 m. Find the area of the field.

OR

Sides of a triangle are in the ratio 12: 17: 25 and its perimeter is 540 cm. Find its area.

Q30. In fig. 4, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that ∠ROS = $\frac{1}{2}$ (∠QOS - ∠POS).

OR

In fig.5, ∠X = 62°, ∠XYZ = 54°, if YO and ZO are the bisectors of ∠XYZ and ∠XZY respectively of ΔXYZ, find ∠OZY and ∠YOZ.

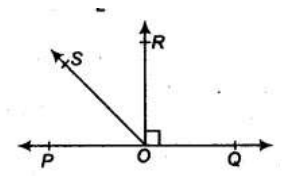

fig. 4

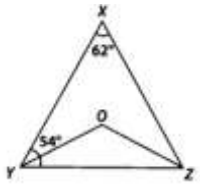

fig. 5

Q31. If a point C lies between two points A and B such that AC = BC, then prove that AC = $\frac{1}{2}$ AB.

Q32. A survey was conducted on 200 drivers in a particular city to record the number of accidents in a month. The data obtained are given in a following table.

Age of Drivers (in years)	0 accidents	1 accident	2 accident	Above 2 accidents
18 - 30	17	23	37	20
30 - 50	13	20	14	11
Above 50	15	16	9	5

Find the probabilities of the following events for a driver chosen at random from the city.

a) Being 18 – 30 years of age and having 2 or more than 2 accidents in a month.

b) Being 30 – 50 years of age and having 1 or more accidents in a month.

What values should be imbibed by the driver to minimize the number of accidents.

Q33. Draw the vertices of a rectangle (1,-1), (4,-1) and (1,-3) on graph paper. Find the coordinates of the fourth vertex.

Q34. In fig. 6, a right triangle ABC, right angled at C, M is the mid – point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B. Show that,

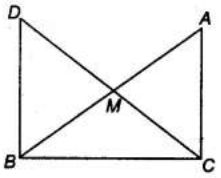

fig. 6

a) ΔAMC ≅ ΔBMD

b) ∠DBC is a right angle

c) ΔDBC ≅ ΔACB.

SECTION- D

Q35. If $x + \frac{1}{x} = 3$, find the value of $x^4 + \frac{1}{x^4}$.

OR

Factorise $x^3 + 3x^2y + 3xy^2 + y^3 - 8$.

Q36. If the polynomials $az^3 + 4z^2 + 3z - 4$ and $z^3 - 4z + a$ leave the same remainder when divided by $z - 3$, find the value of a.

Q37. A park is in the shape of a quadrilateral ABCD, has ∠C = 90°, AB = 9m, BC = 12m, CD = 5m and = 8m. How much area does it occupy?

OR

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 ?

Q38. BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles.

Q39. In fig.7, the side QR of ΔPQR is produced to a point S. If the bisectors of ∠PQR and ∠PRS meet at point T, then prove that ∠QTR = $\frac{1}{2}$ ∠QPR.

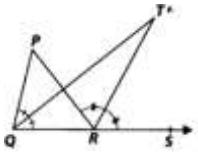

fig. 7

Q40. From a well – shuffled pack of 52 cards, a card is drawn at random, find the probability that it is,

a) a spade

b) black cards

c) ace of diamond

d) king of red colour.