PRINCE PUBLIC SCHOOL
HALF YEARLY EXAMINATION (2019-20)
SAMPLE PAPER-1
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 $\left(\sqrt[3]{x^2}\right)^{\frac{3}{4}}$.

Q2. If the polynomial $3x^4+4x^3-3x-1$ is divided by x - 1 , then the remainder is _____.

Q3. In fig. 1 , ∠AOC +∠BOE = 70˚ and ∠BOD = 40˚,then find ∠BOE and reflex ∠COE. _____

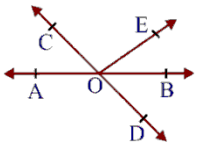

fig. 1

Q4. The value of $[(\frac{5}{6})^{\frac{1}{5}}]^{-1/6}$ is _____.

Q5. Find the measure of an angle whose supplement is equal to the angle itself.

Q6. The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3 : 2. Find the area of the triangle. _____

Q7. Write the coefficient of x^2 in the expansion of $(x-2)^3$.

Q8. An exterior angle of a triangle is $108°$ and its interior opposite angles are in the ratio 4:5. The angles of the triangle are_____.

Q9. In fig.2 , if ABC and ABD are equilateral triangles then find the coordinates of C and D.

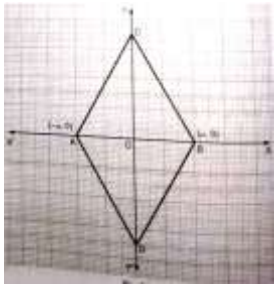

fig. 2

Q10. State Euclid's fifth axiom.

Q11. If the area of an isosceles right triangle is 8cm, what is the perimeter of the triangle? _____

Q12. The angles of a triangle are in the ratio 2 : 3 : 4. Find the measure of the angles. _____

Q13. If P(E) = 0.47, then find P(not E). _____

Q14. If $10^{2y}= 25$, then 10^{-y} =_____.

Q15. A coin is tossed 1000 times, if the probability of getting a tail is 3/8, how many times head is obtained?__

Q16. The opposite sides of a quadrilateral are parallel. If one angle of the quadrilateral is $60°$, find the other angles._____.

Q17. In fig. 3, find the coordinates of the points A, B, C, D, E and F. Which of the points are mirror images In $x - axis$.

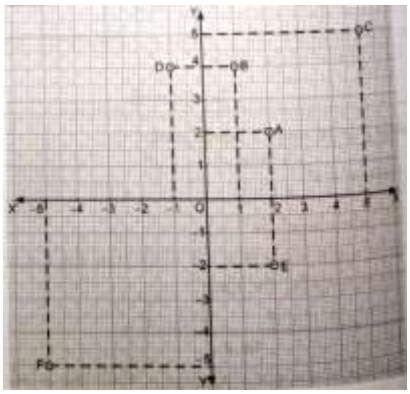

fig. 3

Q18. If a point is on negative side of x-axis at a distance of 5 units from origin, then find the coordinates of the point.

Q19. If x^3+6x^2+4x+k is exactly divisible by x+2 ,then k = _____

Q20. In fig. 4, A teacher shows a triangular cutout $XYZ$to the class.She marked points O and P on sides XY and XZ respectively such that $OX = \frac{1}{2}XY, PX = \frac{1}{2}XZ$ and $OX = PX$. Show that $XY = XZ$. Mention Euclid's axiom which can be used here.

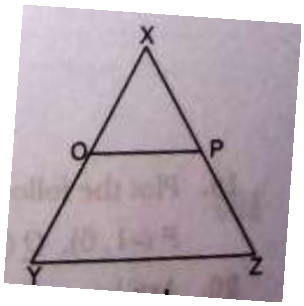

fig. 4

SECTION –B

Q21. Express: $3.1\overline{15}$ in the $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$.

Q22. In which quadrant will the point lie, if
a) the ordinate is 5 and the abscissa is -3 ?
b) the abscissa is -7 and the ordinate is -1 ?

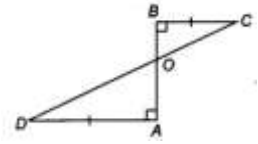

fig. 5

Q23. In fig. 5, AD and BC are equal perpendiculars to a line segment AB. Show that CD bisects AB.

Q24. Factorise the polynomial: $8x^3 - (2x - y)^3$.

Q25. In fig.6, $AC = XD$, C is the mid-point of AB and D is the mid-point of XY. Using a Euclid's axiom, show that $AB = XY$.

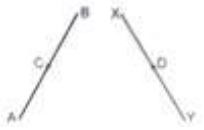

fig. 6

Q26. The perimeter of a triangle is 50 cm. One side of a triangle is 4 cm longer than the smaller side and the third side is 6 cm less than twice the smaller side. Find the area of the triangle.

Q27. In fig.7, if $PQ \perp PS, PQ \parallel SR, \angle SQR = 28°$ and $\angle QRT = 65°$, then find the values of x and y.

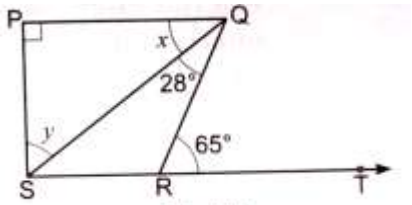

fig. 7

SECTION –C

Q28. Find the value of : $\frac{4}{(216)^{\frac{-2}{3}}} + \frac{1}{(256)^{\frac{-3}{4}}} + \frac{2}{(243)^{\frac{-1}{5}}}$.

OR

If $a = \frac{2+\sqrt{5}}{2-\sqrt{5}}$ and $b = \frac{2-\sqrt{5}}{2+\sqrt{5}}$, then find the value of $a^2 - b^2$.

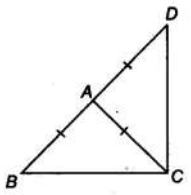

fig. 8

Q29. In fig. 8, ΔABC is an isosceles triangle in which AB = AC. Side BA is produced to D such that AD = AB. Show that ∠BCD is a right angle.

OR

AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD. Show that ∠A > ∠C and ∠B > ∠D.

Q30. Factorise: $x^2 + 3\sqrt{3}\,x - 30$.

Q31. The blood groups of 30 students of class IX 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, B, O. Determine the probability that a student of this class, selected at random, has blood group AB.

OR

Out of 100 balls in a bag 25 are green, 30 are yellow and 45 are white. Find the probability that a ball drawn from the bag is

a) green b) yellow c) white

Q32. Considering the poor and rough condition of soil in the garden, the school authorities decided to cover the entire ground with green grass. The ground is in the shape of a trapezium whose parallel sides are of lengths 18 m and 32 m and non –parallel sides are of lengths 13 m and 15 m. How much is the area of the school playground? Write the values reflected in this question.

Q33. If $z^2 + \frac{1}{z^2} = 14$, find the value of $z^3 + \frac{1}{z^3}$.

Q34. In fig. 9, $AB \parallel CD$. Find the value of x.

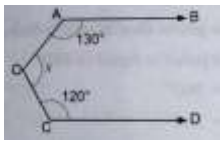

fig. 9

SECTION- D

Q35. Rationalise: $\frac{1}{\sqrt{7}+\sqrt{3}-\sqrt{2}}$.

Q36. In fig.10 , $QT \perp PR, \angle TQR = 40°$ and $\angle SPR = 30°$. Find the value of x, y and z.

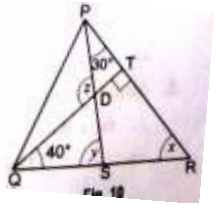

fig. 10

Q37. Find the area of a triangle whose perimeter is 180cm and two of its sides are 80cm and 18cm. Also calculate the altitude of the triangle corresponding to the shortest side.

OR

A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 26 cm, 28 cm and 30 cm, and the parallelogram stands on the base 28 cm. Find the height of the parallelogram.

Q38. Find the value of 'k' if the polynomial p(x)= kx^3+9x^2+4x-10 is divided by (x-3) leaves a remainder -22.

OR

Verify the identity $x^3+y^3=(x+y)(x^2-xy+y^2)$. Using this identity factorise $64y^3+125z^3$.

Q39. Cards marked 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from the box. Find the probability that number on the card is

a) an even number

b) a number which is a perfect square

c) an odd number

d) a number less than 14.

Q40. In fig.11**,** In ΔABC the sides AB and AC of ΔABC are produced to points E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at point O, then prove that $\angle BOC = 90° - \frac{1}{2}\angle A$.

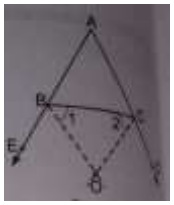

fig. 11