

NORTH-EX PUBLIC SCHOOL
(Senior Secondary, Affiliated To CBSE)
School Block, Jain Nagar, Sector-38, Rohini, Delhi – 81
HALF YEARLY EXAMINATION, 2019-20
SUBJECT – MATH
CLASS - IX

TIME : 3 hrs

MM : 80

General Instructions:

All the questions are compulsory. There are four sections. Section A carries 6 questions of 1 mark each, Section-B carries 6 questions of 2 marks each, Section C carries 10 questions of 3 marks each and Section D carries 8 questions of 4 marks each.

SECTION- A

(20 x1)

1 .State true or false.

(a) Every integer is a whole number.

(b) Every real number is irrational.

2. Find the remainder when $2x^3 - 3x^2 + 4x - 2$ is divided by $x - 2$

3. Without actually calculating the cubes, find the value of $(32)^3 + (-17)^3 + (-15)^3$

4. Find the value of k , if $x - 3$ is a factor of $5x^3 - 3x^2 + 2x - k$.

5. Classify the numbers as rational or irrational. (a) $\sqrt{144}$ (b) 1.50500500050000.....

6. Simplify- $(\sqrt{7} + \sqrt{8})^2$

7. Rationalise the denominator- $\frac{7+3\sqrt{5}}{3\sqrt{5}}$

8. Find the product by using suitable identity. $(4-5x)(4+5x)$ 9.

Express the linear equation $x = 3y$ in the form $ax + by + c = 0$

10. Find two solutions of equation $5x - 2y = 13$

11 . Find the value of k , if $x = 3$, $y = -2$ is a solution of the equation $5x - 2y = 2k$

12. Define perpendicular lines.

13. Read the questions and write the answers.

(a) What is the abscissa of point $(-7, 5)$ (b) What are the coordinates, if a point lies on the origin.

14. If $AC = BD$, then prove that $AB = CD$

15 Check which of the following are solution of equation $x - 4y = 2$

(a) $(1, 2)$

(b) $(2, 0)$

16. Prove that each of the angles of an equilateral triangle is 60°

17. Find the mode of the following marks obtained by 20 students

4, 8, 7, 8, 9, 8, 6, 5, 8, 7, 8, 9, 2, 6, 5, 8, 5, 8, 9, 8

18. State true or false.

(a) If two circles are equal, then their radii are equal. (b) Only one line can pass through a point.

19. If the height (in cm) of 10 students of a class are as follows-

160, 150, 150, 140, 165, 155, 140, 170, 160, 180

Find the mean of the height

20. Find $p(-2)$, if $p(x) = 3x^3 - 4x^2 + x - 3$

SECTION-B

(6X2=12)

21. Prepare a frequency distribution table for the data given, if two coins were tossed 20 times simultaneously. Each time the number of tails occurring was noted as follows—

2 0 2 2 1 2 1 2 0 2

1 0 0 2 2 1 1 2 1

22. Sides of a triangle are in the ratio 22: 25: 27 and its perimeter is 740 cm. Find the sides of the triangle.

23. Express 0.621 in the form of $\frac{p}{q}$.

OR

Simplify- (a) $(7+3x)(4+2x)$ (b) $\frac{\sqrt{256}}{\sqrt{529}}$

24. Represent geometrically $3x-1=0$ as an equation in two variables.

25. Factorise— $x^2 + 13x - 30$

26. Find the area of triangle whose sides are 23 cm, 24cm and 25cm.

SECTION-C

(8X3=24)

27. In fig, if $AB \parallel CD$, $\angle APQ=65^\circ$ and $\angle PRD=130^\circ$, find x and y .

28. Evaluate by using suitable identities- (a) $(110)^3$ (b) 92×108

29. Expand by using suitable identities.

(a) $(3x-5y+9z)^2$ (b) $(7x-3)^3$

OR

Factorise- (a) $49x^2-225y^2$ (b) $729m^3-125n^3$

30. The taxi fare in a city is as follows : for the first km, the fare is Rs.10 ,for subsequent distance it is Rs.7 per km. Taking the distance covered as x km and total fare as Rs.y . Form a linear equation and write three solutions for the equation.

31. In fig, if $PQ \perp PS$, $PQ \parallel SR$, $\angle SQR=30^\circ$ and $\angle QRT=75^\circ$, then find the values of x and y.

OR

AD and BC are equal perpendiculars to a line segment AB. Show that CD bisects AB.

32. An isosceles triangle has perimeter 40 cm and each of the equal sides is 12 cm, Find the area of the triangle.

OR

A park is in the shape of trapezium, whose parallel sides are 25 cm and 10cm and non –parallel sides are 13cm and 14cm. Find the area of the park.

33. Given table represents the seats won by different political parties in the polling outcome of a state elections.

Political party	A	B	C	D	E	F
Seats won	80	70	65	55	45	75

Draw a bar graph.

34. Verify –

$$x^3+y^3+z^3-3xyz = \frac{1}{2} (x+y+z) [(x-y)^2 + (y-z)^2 + (z-x)^2]$$

OR

(a) Check whether $2+5x$ is a factor of $2x^3 + 3x^2 - 5$

(b) Factorise- $6x^2 + 17x + 5$

SECTION-D

(6X4=24)

35. Factorise -

$$2x^3 + 4x^2 - 12x - 6$$

OR

Factorise- $4x^2 + 25y^2 + 9z^2 + 20xy - 30yz - 12xz$

36. Locate the points $(-6,5)$, $(4,2)$, $(9,-3)$, $(2,0)$, $(0,6)$, $(-5,-5)$ on the plane and write in which quadrant or on which axis do they lie ?

37. In fig, If $AB \parallel CD$, $CD \parallel EF$ and $y:z = 2:3$. Find x .

OR

In fig, if $AB \parallel DC$, $\angle BAC = 40^\circ$ and $\angle CDE = 55^\circ$ Find $\angle DCE$.

38. The length of the sides of a triangle are 5cm, 12cm, 13 cm. Find the length of the perpendicular from the opposite vertex to the side whose length is 13 cm

39. A triangle and a parallelogram have same base and same area. If the sides of triangle are 24cm, 32cm, 40cm and the parallelogram stands on the base 24cm. Find the height of the parallelogram.

40. A floral design on a floor is made up of 20 tiles which are triangular, the sides of the triangle being 30cm, 30cm, 48cm. Find the cost of polishing the tiles at rate of 50 paise per cm^2 .

OR

Find the area of a quadrilateral ABCD in which $AB = 4\text{cm}$, $BC = 5\text{cm}$, $CD = 3\text{cm}$, $DA = 6\text{cm}$ and $AC = 8\text{cm}$.