Question Paper DPS (Session 2017-18)

Class- IX **Mathematics** **Time- 3 Hours F.M. 80**

DELHI PUBLIC SCHOOL   NAVI MUMBAI

ANNUAL EXAMINATION 2017 – 18

Class: IX	M. Marks: 80
Subject: Mathematics	Duration: 3hr

Section - A

Question numbers from 1 to 6 cap each.

1. Prove that $(x^{a-b})^{a+b}(x^{b-c})^{b+c}(x^{c-a})^{c+a} = 1$

2. If $p(x) = 2x^3 + 5x^2 - 3x - 2$ divided by $(x + \frac{2}{3})$, then find the remainder.

3. A policeman and th e equidistant from the jewel box. Upon considering jewel box as an origin, the position of policeman is (0,5). If the ordinate of the position of thief is zero, then find the position of the thief.

4. Find the measure of an angle which is 14° more than its compliment.

5. Find the number of cubes of side 2cm that can be cut from a cuboid of dimensions, 5cm x 4cm x 2cm

6. There are 60 boys and 40 girls in a class. A student is selected at random. Find the probability that student is a girl.

SECTION — B

Questions numbers from 7 to 12 carry two marks each.

7. Factorise: $(x - 3y)^3 + (3y - 7z)^3 + (7z - x)^3$

8. If a point C lies between 2 points A and B such that AC = BC, then prove that AC = AB. Explain by drawing the figure.

9. In $\triangle$ ABC, <A + <B = 65° and <B + <C = 140°. Find the value of all the angles of the triangle. .

10. If the diagonals of a cyclic quadrilateral are diameters of the circle through the opposite vertices of the quadrilateral, prove that the quadrilateral is a rectangle.

11. The volume of a right circular cylinder of base radius 10m is 880 m3. Find the total surface area of the cylinder.

12. The Mean of 36 observations is 12. One observation 47 was misread as 74. Find the correct Mean. SECTION — C

Question numbers from 13 to 22 carry three marks each.

13. Represent $\sqrt{5}$ on number line.
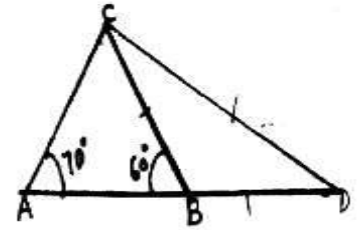
14. Factorise $a^6 - 7a^3 - 8$

15. Determine the point on the graph of the linear equation 2x + 5y = 19, whose ordinate is 1.5 times its abscissa.

16. On environment day, class 9 students got 5 plants of mango, silver oak, orange, banyan and amla from soil department students planted the plants and noted their locations as (x,y)

	Mango	Silver Oak	Orange	Banyan	Amla
x	2	3	0	-3	-2
y	0	4	7	4	0

Plot the points (x,y) in the graph and join them in the given order. Name the figure you get. Which social act is being done by the students of Class 9?
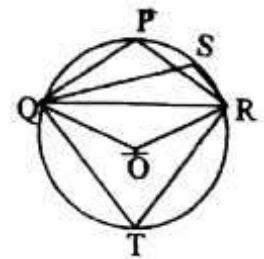
17. In Δ ABC, side AB is produced to D such that BD = BC. If <B = 60° and <A = 70°, prove that (i) AD > CD (ii) AD > AC

OR, Show that the sum of the three altitudes of a triangle is less than the sum of three sides of the triangle.

18. Prove that Vie opposite angles of an isosceles trapezium are supplementary.

19. In the given figure, O is the centre of the circle, ΔPQR is an isosceles triangle with PQ= PR and <PQR = 40°, find the measures of <QSR, <QTR and <QOR.

OR, Prove that equal chords subtend equal angles at the

20. The adjacent sides of a parallelogram ABCD measures 34cm and 20cm and the diagonal AC measures 42cm. find the area of the parallelogram

21. Sixty circular plates, each of radius 7cm and thickness one third of a cm, are placed one above other to form a solid circular cylinder. Find the total surface area and volume of the cylinder so formed.

22. The daily cost of milk (In Rs) supplied to 25 houses in a locality are given below:

Cost	40 - 50	50-80	60 - 74	70 - 80	80 - 90	90 - 100
No. of Houses	4	5	3	5	2	6

23. If one house is chosen at random, find the probability that : (i) the milk bill of the house lies in Rs 60 - 80.

(ii) House is paying less than Rs 70 for the milk bill. (iii) the milk bill of the house is below Rs 50.

SECTION — D

23. If $x = \dfrac{1}{2 - \sqrt{3}}$ fuid the value of $x^3 - 2x^2 - 7x + 5$

24. Factorise: $9a^3 - 27a^2 - 100a + 300$, if it is given that (3a + 10) is a factor of it.

OR Factorise using factor theorem $2x^3 + 7x^2 - 3x - 18$

25. Half the perimeter of a rectangular garden is 36m. Write a linear equation which satisfies this data. Draw the graph of the same. Find the area enclosed by this line and the axes.

26. ABCD is a square. ΔDEC is an equilateral triangle. Prove that: (i) ΔADE ≅ Δ BCE (ii) AE = BE (iii) Find <DAE

27. In Δ DEF, P is the mid - point of EF and Q is mid-point of DP. If ar(ΔDQF) = $6cm^2$ Find ar(ΔEQF)

28. Construct Δ PQR in which QR = 3.2cm , <Q. = 45° and PQ — PR = 1 cm.

29. How many rice bags each cap $196m^3$ of rice can be emptied into a conical tent of base radius 8.4m and height 87.5 m

OR, The slant height and the diameter of a conical tomb are 25m and 14m respectively. Find the cost of constructing it at a rate of Rs 25 per cubic metre and also the cost of white washing its curved surface area at Rs 16 per square metre.

30. Draw a histogram and frequency polygon.

Class Interval	600-640	640-680	680-720	720-760	760-800	800-840
Frequency	18	45	153	288	171	63