SEVEN SQUARE ACADEMY
Academic Year – 2017-2018
Secondary Section
Pre-Board Examination

Name: _____ **Roll No:** _____ **Date: 22/ 01/ 2018**

Class: X **Division:** _____

Subject: Mathematics **TOTAL MARKS: 80** **Time:3 Hrs**

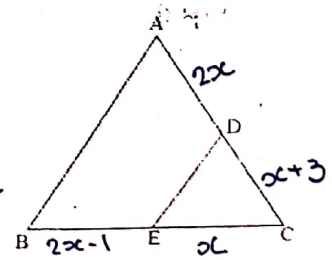
General Instructions:

1) All questions are compulsory
2) The question paper consists of 30 questions divided into sections A, B, C and D.
3) Section A comprises of 6 questions of 1 mark each.
4) Section B comprises of 6 questions of 2 marks each.
5) Section C consists of 10 questions of 3 marks each.
6) Section D comprises of 8 questions of 4 marks each.

SECTION – A

(6 X 1 = 6 marks)

1. The HCF (a, b) =12 and a x b =1800, then find LCM (a, b)
2. Find the roots of $\sqrt{3x^2 + 6} = 9$
3. Is series $\sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}$..... on AP? Give reason.
4. Find the value of 'a' for which point P (a, 2) is the midpoint of the line segment joining the points Q (-5, 4) and R (-1, 0)
5. If A + b = 90° and Sec $A = \frac{5}{3}$, then find the value of cosec B.
6. A In the figure of ΔABC, DE ∥ AB. If AD = $2x$, DC = $x + 3$, BE = $2x - 1$ and CE = x, then find the value of x.



SECTION – B

(6 X 2 = 12 marks)

7. Using Euclid's algorithm, find the HCF of 240 and 228.
8. Find the 7^{th} term from the end of AP 7, 10, 13.....184.
9. On comparing the ratios, find out whether the following pair of linear equations is consistent or inconsistent; and what type of solution it will have? $4x + 10y = 26$; $4x - 9y = 7$

10. If the points P (x, y) is equidistant from the points A (3, 1) and B (-1, 5), prove that $3x = 2y$.

11. Sachin buys a fish from a shop for his aquarium. The snopkeeper takes out one fish at random from a tank containing 5 male fish and 8 female fish. What is the probability that the fish taken out is a male fish?

12. Cards marked with number 3, 4, 5,.....50 are placed in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that the selected card bears a perfect square number.

SECTION – C

(10 X 3 = 30 marks)

Solve the following:-

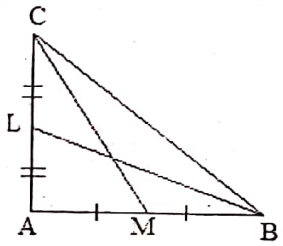
13. Show that any positive odd integers is of the form $6q + 1$, $6q + 3$ or $6q + 5$ where q is some integers.

14. If one zero of polynomial $3x^2 - 8x + 2k + 1$ is 7 times the other. Find the value of k.

15. Solve the following pair of linear equation graphically: $4x - y = 4$ and $4x + y = 12$ Also from the graph. find the point of intersection of both lines.

16. Find the coordinates of a point P on line segment joining A(1, 2) and B(6, 7) such that $AP = \frac{2}{5}AB$

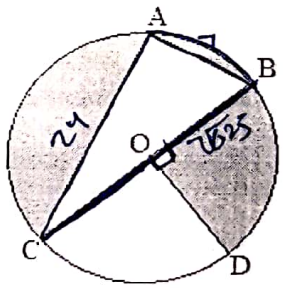
17. In the given figure, BL and CM are medians of ΔABC, right angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$



18. Prove that: $\frac{Sin\,\theta - 2\,Sin^3\theta}{2Cos^3\,\theta - Cos\,\theta} = \tan\theta$

19. ΔABC is a right angle triangle right angled at A. A circle is inscribed in it. The lengths of two sides containing the right angle are 24cm and 10cm. Find the radius of the circle.

20. In the given figure, O is the centre of the circle with AC = 24cm, AB = 7cm and $\angle BOD = 90^o$. Find the area of the shaded region. [Use $\pi = 3.14$]



21. A right circular cone of radius 3cm has a curved surface area of 47.1cm^2. Find the volume of the cone. [Use $\pi = 3.14$]

22. Find the modal words typed by a typist.

No. of words typed per minute	30 – 39	40 - 49	50 - 59	60 - 69	70 - 79
No. of typists	2	8	15	12	3

SECTION-D

(8 X 4 = 32 marks)

Solve the following:-

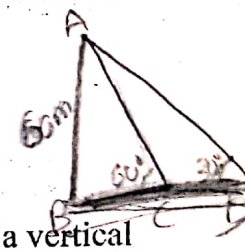
23. A passenger while boarding the plane slipped from the stair and got hurt. The pilot took the passenger in the emergency clinic at the airport for treatment. Due to this, plane got delayed by half an hour. To reach the destination 1500km away in time so that passenger could catch the connecting flight, the speed of the plane was increased by 250km/hr than usual speed. What is the usual speed of the plane? What value is depicted in this question?

24. The minimum age of children to be eligible to participate in a painting competition is 8 years. It is observed that the age of youngest boy was 8 years and the ages of rest of participants are having a common difference of 4 months. If the sum of ages of all the participants is 168 years, find the age of the eldest participant in the painting competition.

25. In an equilateral triangle ABC, D is a point on side BC such that 4BD = BC. Prove that $16AD^2 = 13\ BC^2$

26. Draw a right angled triangle whose hypotenuse and one side measures 10cm and 8cm respectively. Then construct another triangle whose sides are $\frac{4}{5}$ times the corresponding sides of this triangle.

27. Prove that: $\left(\frac{1+Sin\,\theta - Cos\,\theta}{1+Sin\,\theta + Cos\,\theta}\right)^2 = \frac{1-Cos\,\theta}{1+Cos\,\theta}$



28. From the top of a building 60m high, the angles of depression of the top and bottom of a vertical lamp post are observed to be 30° and 60° respectively. Find:
    (i) The horizontal distance between the building and the lamp post
    (ii) The height of the lamp post. ($\sqrt{3} = 1.732$)

29. A bucket open at the top is of the form of a frustrum of a cone. The diameter of its upper and lower circular ends are 40cm and 20cm respectively. If total 17600cm^3 of water can be filled in the bucket, find its total surface area?

30. Find mean and median of the following data:

Ages (in yrs)	5 - 7	7 - 9	9 - 11	11 -13	13 - 15	15 - 17	17 - 19
No. of students	70	120	32	100	45	28	5

XXX ALL THE BEST XXX