



INDIAN SCHOOL SOHAR
PRE-BOARD EXAMINATION (2019-20)
MATHEMATICS-STANDARD

CLASS: X
DATE: 25/01 /2020

MAX. MARKS: 80
DURATION: 3 HRS

General Instructions:

1. All questions are compulsory
2. The question paper consists of 40 questions divided into 4 sections A, B, C and D.
3. Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
4. There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each and three questions of four marks each .You have to attempt only one of the alternatives in all such questions.
5. Use of calculators is not permitted.

SECTION A

(Q.1 – Q.10) are multiple choice questions. Select the appropriate answer from the given options.

1. If $HCF(a, 8) = 4$, $LCM(a, 8) = 24$, then a is :
 (a) 8 (b) 10 (c) 12 (d) 14
2. The mode is equal to
 a) $2 \text{ Median} - 3 \text{ Mean}$ (b) $3 \text{ Median} + 2 \text{ Mean}$
 (c) $3 \text{ Median} - 2 \text{ Mean}$ (d) $2 \text{ Median} + 3 \text{ Mean}$
3. H.C.F. of two co-prime numbers is :
 (a) 1 (b) 2 (c) 0 (d) 3
4. The graphical representation of the pair of equations $x+2y - 4 = 0$ and $2x +4y - 12 = 0$ is :
 (a) Intersecting lines (b) Parallel lines
 (c) Coincident lines (d) All the above
5. If $\sin \theta = \cos \theta$, the value of $\operatorname{cosec} \theta$ is
 (a) 2 (b) 1 (c) $\frac{2}{\sqrt{3}}$ (d) $\sqrt{2}$
6. If $\sqrt{2} \sin (60^\circ - \alpha) = 1$, then α is
 (a) 45° (b) 15° (c) 60° (d) 30°
7. Which of the following is not defined ?
 (a) $\cos 0^\circ$ (b) $\tan 45^\circ$ (c) $\sec 90^\circ$ (d) $\sin 90^\circ$
8. AOBC is a rectangle whose three vertices are A (0,3), O (0,0) and B (5,0). The length of its diagonal is
 (a) 5 (b) 3 (c) $\sqrt{34}$ (d) 4

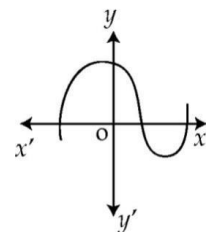
9. The area of a triangle with vertices A(3,0) , B(7,0) and C(8,4) is
 (a) 8 (b) 28 (c) 14 (d) 6
10. If the distance between the points (p,4) and (0,1) is 5, then the value of p is
 (a) 4 only (b) 0 (c) -4 only (d) ± 4

(Q.11 – Q.15) Fill in the blanks

11. The radii of two cylinder are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. The ratio of their volume is _____
12. The value(s) of k such that the equation $kx^2 + 6x + k = 0$ has equal roots is (are) _____

OR

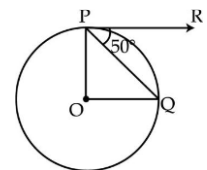
The graph of $y = p(x)$ given below. The number of zeroes of $p(x)$ is _____



13. PQ is drawn parallel to the base BC of a ΔABC cutting AB at P and AC at Q. If $AB = 4BP$ and $CQ = 2$ cm, then AC is equal to _____ cm
14. If the common difference of an A.P. is 5, then the value of $a_{18} - a_{14}$ is _____
15. A girl calculates the probability of her winning the game in a match is 0.08. The probability of her losing the game is _____

(Q.16 – Q.20) Answer the following

16. After how many places will the decimal expansion of $\frac{14587}{1250}$ terminate?
17. If the ratio of the corresponding sides of two similar triangles is 3 : 4, then what is the ratio of their perimeters ?
18. If O is centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ, then what is measure of $\angle POQ$?



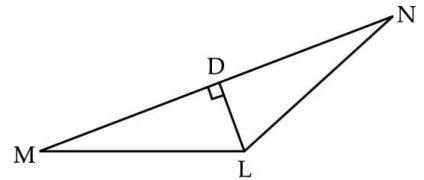
OR

From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. Find the radius of the circle.

19. What is the 10th term of the sequence $\sqrt{2}$, $\sqrt{8}$, $\sqrt{18}$,
20. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then what is the value of k ?

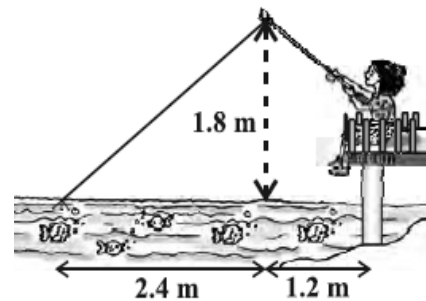
SECTION B

21. Which term of the A.P. $-2, -7, -12, \dots$ will be -77 ?
22. If all the sides of a parallelogram touch a circle, show that the parallelogram is a rhombus
23. In the given figure, If $LD \perp MN$, then Prove that $LM^2 + DN^2 = LN^2 + MD^2$



OR

Tina is fly fishing in a stream. The tip of her fishing rod is 1.8m above the surface of the water and the fly at the end of the rests on the water 3.6m away and 2.4m from a point directly under the tip of the rod. Assuming that the string (from the tip of the rod to the fly) is taut, how much string should she have out?

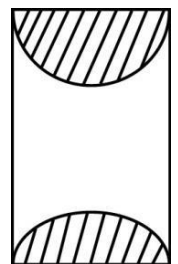


24. Prove that $(\sqrt{3} + 1)(3 - \cot 30^\circ) = \tan^3 60^\circ - 2\sin 60^\circ$
25. A lot consists of 48 mobile phones of which 42 are good, 3 have only minor defects and 3 have major defects. Tanya will buy a phone if it is good but the trader will only buy a phone if it has no major defect. A phone is selected at random from the lot. What is the probability that it is
- Acceptable to Tanya
 - Acceptable to the trader

OR

Two dice are thrown at the same time and the product of the numbers appearing on it is noted. Find the probability that the product is less than 9

26. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder as shown in the figure .If the height of cylinder is 10cm and its base radius is 3.5 cm. Find the total surface area of article. $\left(Use \pi = \frac{22}{7} \right)$



SECTION C

27. Use Euclid's algorithm to find the HCF of 441, 567 and 693.

OR

Prove that $\sqrt{2}$ is an irrational number

28. If sum of first 6 terms of an A.P. is 36 and that of the first 16 terms is 256, find the sum of the first 10 terms.

29. Solve $\frac{4}{x} + 3y = 14$, $\frac{3}{x} - 4y = 23$

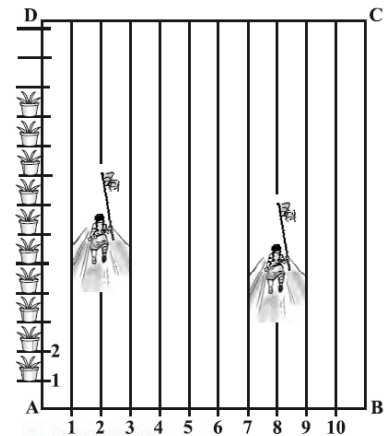
OR

A takes 3 hours more than B to walk 30 km but if A doubles his pace, he is ahead of B by 1½ hours. Find their speeds of walking.

30. Divide $p(x) = x^4 - 5x + 6$ by $g(x) = 2 - x^2$ and find the quotient and the remainder.

31. In a rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 flower pots have been placed at a distance of 1m from each along AD.

Niharika runs $\frac{1}{4}$ th the distance AD on the second line and posts a green flag and Priya runs $\frac{1}{5}$ th the distance AD on the eighth line and posts a red flag. What is the distance between the two flags ? If Rashmi posts a blue flag exactly halfway between the line segment joining the flags, where should she post her flag?

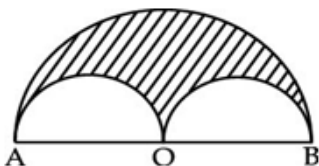


32. If $1 + \sin^2 \theta = 3 \sin \theta \cos \theta$, then prove that $\tan \theta = 1$ or $\frac{1}{2}$

OR

Evaluate $\frac{\cos^2 20^\circ + \cos^2 70^\circ}{\sec^2 50^\circ - \cot^2 40^\circ} + 2 \operatorname{cosec}^2 58^\circ - 2 \cot 58^\circ \tan 32^\circ$

33. In the given figure, a semicircle is drawn on AB as diameter, and O is center. Semi circular flower beds are formed on AO and OB as diameters. If AB is 28 m, find the area of the shaded region.



34. Change the following frequency distribution to less than type distribution and draw its ogive

Classes	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25
Frequency f	6	8	10	6	4

SECTION D

35. Draw a right triangle ΔABC in which $BC = 12$ cm , $AB = 5$ cm and $\angle B = 90^\circ$. Construct a triangle similar to it and of scale factor $\frac{2}{3}$. Is the new triangle also a right triangle ?

OR

Draw a circle of radius 3 cm. Construct a pair of tangents to it, which are inclined to each other at an angle of 45° .

36. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.
37. A fast train takes 3 hour less than a slow train for a journey of 600 km. If the speed of the slow train is 10km/hr less than that of the fast train, find the speeds of the two trains.

OR

Solve : $\frac{1}{(2x-3)} + \frac{1}{(x-5)} = 1, x \neq 5, \frac{3}{2}$

38. Find the volume of the largest solid right circular cone that can be cut out of a solid cube of side 14 cm. Also find the slant height of the cone. $\left(Use \pi = \frac{22}{7} \right)$

OR

A cylindrical vessel with internal diameter 10cm and height 10.5 cm is full of water. A solid cone of base diameter 7cm height 6cm is completely immersed in water. Find the volume of
(i) Water displaced out of the cylindrical vessel

(ii) Water left in the cylindrical vessel. $\left(Use \pi = \frac{22}{7} \right)$

39. The angles of depression of the top and bottom of an 8 m tall building from the top of a multi-storeyed building are 30° and 45° respectively. Find the height of the multi-storeyed building and the distance between the two buildings.
40. Find the mean, mode and median of the following distribution.

Classes	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency f	6	5	12	22	15