



**DELHI PUBLIC SCHOOL VINDHYANAGAR**  
**PRE-BOARD EXAMINATION 1 (2019-20)**

**CLASS - X**  
**SUBJECT - MATHEMATICS(BASIC)**

**Max. Marks: 80**  
**Time: 3 Hrs.**

General Instructions

- (i) All questions are compulsory.  
 (ii) The question paper consists of 40 questions divided into four sections A, B, C & D.  
 (iii) Section: A comprises of twenty questions of 1 mark each, Section: B comprises of six questions of 2 marks each, Section: C comprises of eight questions of 3 marks each & Section: D comprises of six questions of 4 marks each.  
 (iv) There is no overall choice. However internal choices have 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 4 marks each.

Section: A

*Q. 1-10 are multiple choice questions. Select the most appropriate answer from the given options.*

- HCF of 210 & 55 is  
 a) 5                      b) 10                      c) 11                      d) 15
- Which of the following is not a measure of central tendency?  
 a) Mean                      b) Median                      c) Mode                      d) Standard Deviation
- The angle between tangent at a point on a circle and the radius through the point is \_\_\_\_\_ degree.  
 a) 90                      b) 120                      c) 180                      d) 45
- If  $140 = 2^m \times 5^n \times 7^p$  then  $m + n - p =$   
 a) 1                      b) 2                      c) 3                      d) 4
- The product of the zeroes of the polynomial  $2x^2 - 4x + 5$  is  
 a)  $\frac{1}{2}$                       b)  $\frac{2}{5}$                       c)  $\frac{5}{2}$                       d)  $\frac{-5}{2}$
- One card is drawn from a well shuffled deck of 52 cards. The probability that the card drawn is an ace is  
 a)  $\frac{1}{13}$                       b)  $\frac{12}{13}$                       c)  $\frac{11}{13}$                       d)  $\frac{3}{13}$
- If one zero of the quadratic polynomial  $x^2 + 3x + k$  is 2, the value of k is  
 a) 10                      b) 5                      c) -10                      d) -5
- The rational number  $\frac{17}{8}$  has \_\_\_\_\_ decimal expansion.  
 a) Terminating                      b) Non Terminating Repeating  
 c) Non terminating & non repeating                      d) None of these.

9. If the mid-point of the line joining (3, 4) & (k, 8) is (2, 6), then the value of k is  
a) 1                      b) 2                      c) 3                      d) 4

10. The distance of the point P (2, -4) from the x-axis is  
a) 1 unit                      b) 2 units                      c) 3 units                      d) 4 units

**Q. 11-15 Fill in the blanks**

11. The value of k for which the system of equations  $2x + 3y = 5$  and  $4x + ky = 10$  has infinite number of solutions is \_\_\_\_\_.

**OR**

The discriminant of the quadratic equation  $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$  is \_\_\_\_\_.

12. The ratio in which the point (2, y) divides the line segment joining the points A (-2, 2) & B (3, 7) is \_\_\_\_\_.

13. The value of  $\operatorname{cosec} 30^\circ + \cot 45^\circ$  is \_\_\_\_\_.

14. The areas of two similar triangles are in the ratio 9 : 16, then the ratio of their corresponding sides is \_\_\_\_\_.

15. Value of  $\operatorname{cosec} 30^\circ \cos 60^\circ \tan 45^\circ \sin 90^\circ \sec 45^\circ \cot 30^\circ$  is \_\_\_\_\_.

**Q. 16-20 Answer the following:**

16. If the diameter of a semi circular protractor is 14 cm, then find its perimeter.

17. If  $4 \sec \alpha = 5$ , then find the value of  $\frac{1 - \tan \alpha}{1 + \tan \alpha}$

**OR**

In  $\Delta ABC$ , right angled at B,  $AB = 24$  cm,  $BC = 7$  cm. Find the value of  $\tan A$ .

18. An unbiased die is thrown once. Find the probability of getting a multiple of 3.

19. If  $x + 1$ ,  $3x$  &  $4x + 2$  are in AP, find the value of x.

20. In a  $\Delta ABC$ , D and E are points on the sides AB and AC respectively, such that  $DE \parallel BC$ . If  $AD = 6$  cm,  $DB = 9$  cm and  $AE = 8$  cm, find EC.

**Section: B**

21. Two dice are thrown simultaneously. Find the probability of getting a same number on both dice i.e. a doublet.

**OR**

A bag contains 8 red, 6 white & 4 black balls. A ball is drawn at random from the bag. Find the probability that the drawn ball is red or white.

22. A bag contains cards which are numbered from 2 to 90. A card is drawn at random from the bag. Find the probability that it bears a number which is a perfect square.

23. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.
24. Find the area of a quadrant of a circle whose circumference is 22 cm.
25. Prove that  $\tan 10^\circ \tan 15^\circ \tan 75^\circ \tan 80^\circ = 1$ .

**OR**

Evaluate  $\frac{\tan 35^\circ}{\cot 55^\circ} + \frac{\cot 78^\circ}{\tan 12^\circ} - 1$

26. Find a quadratic polynomial, the sum and product of whose zeroes are  $\sqrt{2}$  &  $\frac{-3}{2}$  respectively.

**Section: C**

27. Divide a line segment of length 10 cm internally in the ratio 3 : 2.

**OR**

—Draw a circle of radius 3 cm. Take a point at a distance of 5.5 cm from the centre of the circle. From point P, draw two tangents to the circle.

28. Find the zeroes of the polynomial  $f(u) = 4u^2 + 8u$ , and verify the relationship between the zeroes and its coefficients.
29. Prove that  $(1 + \tan^2\theta) (1 + \sin\theta) (1 - \sin\theta) = 1$

**OR**

Prove that  $\operatorname{cosec}^2\theta + \sec^2\theta = \operatorname{cosec}^2\theta \sec^2\theta$ .

30. A race track is in the form of a ring whose inner circumference is 352 m and the outer circumference is 396 m. Find the width of the track.
31. A circle touches all the four sides of a quadrilateral ABCD. Prove that  $AB + CD = BC + AD$ .
32. There is a circular path around a sports field. Priya takes 18 min. to drive one round of the field, while Ravi takes 12 min. for the same. Suppose they both start at the same point and at the same time and go in the same direction. After how many minutes will they meet again at the starting point.

**OR**

Prove that  $3 + 2\sqrt{5}$  is irrational, given that  $\sqrt{5}$  is irrational.

33. Meena went to a Bank to withdraw Rs. 2000. She asked the cashier to give her Rs. 50 and Rs. 100 notes only. Meena got 25 notes in all. Find how many notes of Rs. 50 and Rs. 100 she received.
34. If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in the order, find x & y.

**Section: D**

35. The sum of the reciprocals of Rehman's ages, (in years) 3 years ago and 5 years from now is  $\frac{1}{3}$ . Find his present age.
36. How many terms of the AP : 24, 21, 18, ..... must be taken so that their sum is 78.



**OR**

If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

37. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle  $30^\circ$  with it. The distance between the foot of the tree to the point where the top touches the ground is 8m. Find the height of the tree.
38. In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then prove that the angle opposite to the first side is a right angle.

**OR**

BL & CM are medians of  $\Delta ABC$  right angled at A. Prove that  $4 (BL^2 + CM^2) = 5 BC^2$ .

39. A hemispherical tank full of water is emptied by a pipe at the rate of  $3\frac{4}{7}$  litres per second. How much time will it take to empty the tank, if it is 3 m in diameter.

**OR**

Metallic spheres of radii 6 cm, 8 cm and 10 cm respectively are melted to form a single solid sphere. Find the radius of the resulting sphere.

40. The following table gives production yield per hectare of wheat of 100 farms of a village

Production Yield (kg/ha)	50 – 55	55 – 60	60 – 65	65 -70	70 -75	75 -80
Number of Farms	2	8	12	24	38	16

Change the distribution to a more than type distribution and draw its Ogive.

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