

**CHENNAI SAHODAYA SCHOOL COMPLEX**  
**PRE-BOARD COMMON EXAMINATION - 2020**  
**STANDARD MATHEMATICS - SET - I**

**Class : X Std**

**Total Marks : 80**

**Time : 3 Hrs.**

**General Instructions.**

- **All questions are compulsory.**
- **The question paper containing 40 questions is divided into four sections - A , B , C & D.**
- **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.**
- **All the questions in Section - A are to be answered in one word, one sentences or as per the exact requirement of the question.**

**Section - A**

**Direction for Q 1 to 5 : Fill in the blanks to make the statement true.**

1. For some integers a and 3, there exists unique integers q and r such that  $a = 3q + r$ . The possible values of r are \_\_\_\_\_
2. The degree of a zero polynomial is \_\_\_\_\_  
(Or)

If zero of a polynomial is zero, then the degree of the polynomial is \_\_\_\_\_

3. The nth term of an AP is  $7-4n$ . Find the common difference.
4. If  $\triangle ABC \cong \triangle QRP$   $\frac{ar(\triangle ABC)}{ar(\triangle PQR)} = \frac{9}{4}$ ,  $AB = 18\text{cm}$  and  $BC = 15\text{cm}$ .  
Then the value of PR is \_\_\_\_\_
5. The point of intersection of three medians of a triangle is called \_\_\_\_\_

**Direction for Q.6 to 15. Select the most appropriate answer from the given options.**

6. The number of decimal places after which the decimal expansion of the rational number  $\frac{91}{2^6 \times 5^5}$  will terminate is \_\_\_\_\_  
(a) 6 (b) 5 (c) 11 (d) 8
7. One equation of a pair of dependent linear equation is  $-5x + 7y = 2$ . The second equation can be \_\_\_\_\_  
(a)  $10x + 14y + 4 = 0$  (b)  $-10x - 14y + 4 = 0$   
(c)  $-10x + 14y + 4 = 0$  (d)  $10x - 14y = -4$

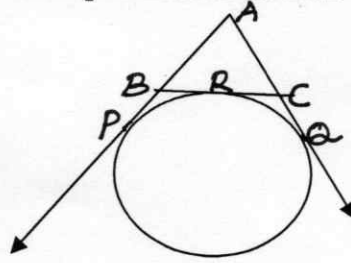
8. The 4<sup>th</sup> term from the end of an A.P -10, -7, -4 , .....48 is \_\_\_\_\_  
 (a) 57 (b) 39 (c) 42 (d) - 1
9. If  $\Delta ABC \cong \Delta PQR$  ,  $BC = 6.5$  cm and  $QR = 10.4$  cm and perimeter of  $\Delta PQR = 96$ cm. Then the perimeter of  $\Delta ABC$  is \_\_\_\_\_  
 (a) 19.2 cm (b) 60 cm (c) 6cm (d) None of these
10. If A  $\left(\frac{m}{3}, 5\right)$  is the midpoint of the line segment joining the points Q (-6,7) and R (-2,3). Then the value of m is \_\_\_\_\_  
 (a) -12 (b) -4 (c) 12 (d) -6
11. Read the two statements A and B, then choose the correct option from the following.  
 A : Two vertices of a triangle are (6,3) and (-1,7) and its centroid is (1,5). Then the third vertex is (-2,5).  
 B : Co-ordinates of centroid of a triangle having vertices  $(x_1, y_1)$  ,  $(x_2, y_2)$  ,  $(x_3, y_3)$  is  $\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$
- (a) Both A and B are correct and B is not the correct explanation for A.  
 (b) Both A and B are correct and B is the correct explanation for A .  
 (c) A is true and B is false.  
 (d) B is true and A is false.
12. If  $3 \tan^2 x - 1 = 0$  and  $0 < x < 90^\circ$ , then the value of x is \_\_\_\_\_  
 (a)  $60^\circ$  (b)  $30^\circ$  (c)  $0^\circ$  (d)  $45^\circ$
13. Volumes of two spheres are in the ratio 64 : 27. The ratio of their surface area is \_\_\_\_\_  
 (a) 3 : 4 (b) 4 : 3 (c) 9 : 16 (d) 16 : 9
14. If the mean and median of a sequence of numbers are 11.9 and 12 . 1 the mode is \_\_\_\_\_  
 (a) 10.8 (b) 12.5 (c) 11.5 (d) 11.2
15. If a die is thrown twice, the probability that 5 will not come up either time is \_\_\_\_\_  
 (a)  $\frac{1}{36}$  (b)  $\frac{5}{36}$  (c)  $\frac{17}{36}$  (d)  $\frac{25}{36}$

**Direction for Q.16 to 20. Answer the following.**

16. Write one rational and one irrational number lying between 0.25 and 0.32.
17. If two tangents inclined at an angle  $60^\circ$  are drawn to a circle of radius 3cm, then find the length of each tangent.

(Or)

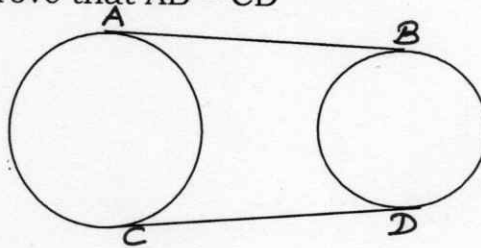
In the figure, find the perimeter of  $\triangle ABC$ , if  $AP = 10\text{cm}$ .



18. If  $x = a \cos \theta$  and  $y = b \sin \theta$ . Then find the value of  $b^2 x^2 + a^2 y^2$
19. If  $\sec (40^\circ + x) = \operatorname{cosec} 30^\circ$ . Find the value of  $x$ .
20. Find the least value of  $k$  for which the quadratic equation  $-3x^2 - 6x + k = 0$  has real roots.

#### Section - B

21. How many multiples of 4 lie between 10 and 205.
22. If areas of two similar triangles are equal. Prove that they are congruent.
23. The distance between the tops of two trees of height 20m and 28m is 17m. Find the horizontal distance between the two trees.
24. In the figure, AB and CD are common tangents to two circles of un equal radii. Prove that  $AB = CD$



25. A hemispherical lead of radius 9cm is melted and recasted into a right circular cone of height 72cm. Find the radius of the base of the cone.
26. If the mean of the following distribution is 8, find the value of  $P$ .  
5, 10,  $P + 3$ , 7, 8

(Or)

The mean height of 8 students is 152 cm. Two more students of heights 143 cm and 156 cm join the group. What is the new mean height.

#### Section - C

27. In a game of chance, a moving wheel has 6 numbers 1,2,3,4,5 and 6 one has to make it move around its axis. If there are equally likely outcomes, what is the probability that the pointer will point at
  - (a) a multiple of 2
  - (b) the least number
  - (c) the greatest number

(Or)

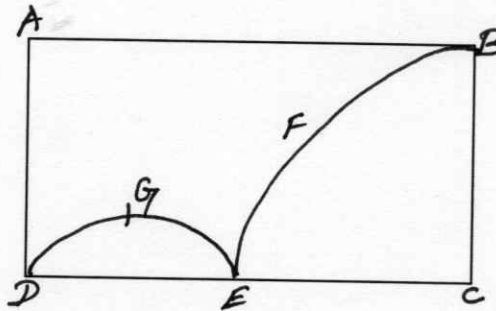
: 4 :

Cards marked with numbers 1,3,5,.....101 are placed in a bag and mixed thoroughly. A card is then drawn at random from the bag. Find the probability that the number drawn card is

(i) less than 19

(ii) a prime number less than 20

28. For a project work, a student uses a rectangular card board ABCD as shown in figure with AB = 14cm, BC = 7cm. By a pair of scissors, she cuts a quarter circle BFEC and semi circle DGE from it and uses the remaining part in making a cap. Calculate the area of the remaining part of the rectangle. Suggest your opinions on student's idea.



29. Prove that

$$\frac{1}{\operatorname{cosec} \theta - \cot \theta} - \frac{1}{\sin \theta} = \frac{1}{\sin \theta} - \frac{1}{\operatorname{cosec} \theta + \cot \theta}$$

(Or)

Prove that

$$\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$$

30. The line joining the points (2,-1) and (5,-6) is bisected at p lies on the line  $2x + 4y + k = 0$ . Find the value of k.
31. If the nth term of an A.P. is  $2n + 1$ , find the sum of first n terms of the A.P.
32. The angles of a cyclic quadrilateral ABCD are  $\angle A = (6x + 10)^\circ$ ,  $\angle B = (5x)^\circ$ ,  $\angle C = (x + y)^\circ$  and  $\angle D = (3y - 10)^\circ$ . Find x and y and hence the values of four angles.

(Or)

$$\text{Solve : } \frac{2}{x + y} + \frac{5}{x - y} = 3$$

$$\frac{7}{x + y} - \frac{2}{x - y} = 4 \quad (x \neq \pm 4)$$

33. If two zeroes of polynomial  $P(x) = 2x^4 + 10x^3 + 5x^2 - 35x - 42$  are -3 and -2. Find other zeroes.
34. Prove that  $3 - \sqrt{5}$  is an irrational number.

(Or)

If HCF of 144 and 180 is expressed in the form  $13m - 16$ . Find the value of m.

**Section - D**

35. A car covers a distance of 400 km at a certain speed. Had the speed been 12km/h more, the time taken for the journey would have been 1 hour 40 minutes less. Find the original speed of the car.

(Or)

$$\frac{1}{x} - \frac{1}{x-2} = 3, x \neq 0, 2$$

36. A boy standing on a horizontal plane finds a bird flying at a distance of 100m from him at an elevation of  $30^\circ$ . A girl standing on the roof of 20m high building, finds the angle of elevation of the same bird to be  $45^\circ$ . Both the boy and girl are on opposite sides of the bird. Find the distance of the bird from the girl.
37. Draw a  $\Delta ABC$  with side  $BC = 6.5$  cm  $\angle B = 30^\circ$ ,  $\angle A = 105^\circ$ . Then construct another triangle whose sides are  $\frac{3}{4}$  times the corresponding sides of the  $\Delta ABC$ .

(Or)

Construct a pair of tangents to a circle of radius 3cm which are inclined to each other at an angle of  $60^\circ$ .

38. A sphere of diameter 12cm, is dropped in a right circular cylindrical vessel, partly filled with water. If the sphere is completely submerged in water, the water level in the cylindrical vessel rises by  $3\frac{5}{9}$  cm. Find the diameter of the cylindrical vessel.

(Or)

A solid right circular cone of diameter 14cm and height 8cm is melted to form a hollow sphere. If the external diameter of the sphere is 10cm. Find the Internal diameter.

39. During the medical check up of 35 students of a class, their weights were recorded as following.

Wt. in Kg.	No. of students
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw less than type Ogive for the given data. Hence obtain the median weight from the graph and verify the result by using formula.

40. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio.

**\*\*All the Best\*\***