

**PRE-BOARD-STANDARD (041) (2019-2020)**

GRADE: X CBSE

TOTAL MARKS:

80

**MATHEMATICS**

DATE: \_\_\_\_\_

TIME: 3Hours

**Instructions:-**

- (i) All questions are compulsory
- (ii) The paper consists of 40 questions divided into four sections A,B,C and D
- (iii) Section A consists of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C consist of questions of 3 mark each. Section D consist of 6 questions of 4 mark each.
- (iv) Internal choices are given in all sections. You have to attempt only one of the alternatives in all such questions.
- (v) Use of calculators is not permitted.

**SECTION A**

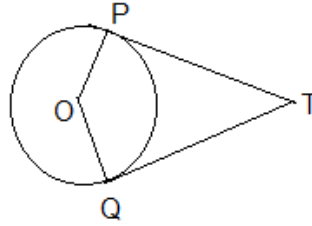
1. The class mark of 120-150 is  
a) 30    b) 130    c) 135    d) 150
2. The probability of getting a number less than 11 from a box of 25 cards is  
a) 1    b) 0    c) 1/5    d) 2/5
3. If  $p_1, p_2$  are two odd prime numbers such that  $p_1 > p_2$ , then  $p_1^2 - p_2^2$  is  
a) Even number    b) odd number  
c) Odd prime number    d) prime number
4. The point of intersection of the lines represented by  $3x - 2y = 6$  and the y-axis is  
a) (2,0)    b) (0,-3)    c) (-2,0)    d) (0,3)
5. The quadratic equation  $2x^2 - \sqrt{5}x + 1 = 0$  has  
a) two distinct real roots  
b) two equal real roots  
c) no real roots  
d) more than two roots
6. If the perimeter of one face of a cube is 20cm, then its surface area is  
a) 120 cm<sup>2</sup>    b) 150 cm<sup>2</sup>    c) 125 cm<sup>2</sup>    d) 400 cm<sup>2</sup>
7. HCF of 6, 72 and 120 is  
a) 4    b) 32    c) 6    d) 24
8. If the common difference of an A.P is 5, then value of  $a_{18} - a_{13}$   
a) 5    b) 20    c) 30    d) 25
9. Which of the following statements are false?  
a) All isosceles triangles are similar  
b) All equilateral triangles are similar  
c) All circles are similar  
d) None of these
10. The distance between the points (a, b) and (-a, -b) is  
a) 2a    b) 0    c) 2b    d)  $2\sqrt{a^2 + b^2}$

### Fill in the blanks

11. The LCM of  $x$  and 18 is 36 and HCF of  $x$  and 18 is 2. The number  $x$  is \_\_\_\_.
12. The quadratic polynomial formed whose sum and product of zeros are 4,1 is \_\_\_\_.

OR

- The value of  $x$  for the polynomials  $x^2 - 1$  and  $x^2 - 2x + 1$  has the equal roots is \_\_\_\_.
13. TP and TQ are two tangents to a circle with center O  $\angle POQ = 130^\circ$ , then  $\angle PTQ$  is \_\_\_\_.



14.  $\sin \alpha = \frac{\sqrt{3}}{2}$  and  $\cos \beta = 0$ , then  $\beta - \alpha$  is \_\_\_\_.
15.  $\cos^4 A - \sin^4 A$  is equal to \_\_\_\_.

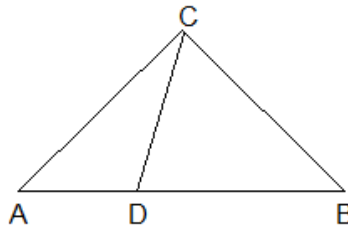
### Answer the following

16. If  $P-1$ ,  $P+3$  and  $3P-1$  are the three consecutive terms of an A.P, what is the value of  $P$ ?

OR

There are 60 terms in an A.P of which the first term is 8 and last term is 185. What is the 31<sup>st</sup> term?

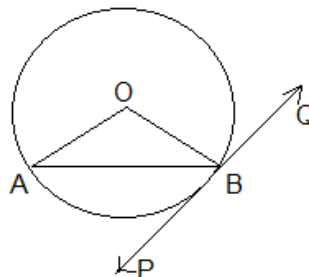
17. Evaluate the value of  $9\sec^2 A - 9\tan^2 A$ .
18. In figure, if  $\angle ACB = \angle CDA$ ,  $AC=6\text{cm}$  and  $AD=3\text{ cm}$ , then find the length of  $AB$ .



19. Find the ratio in which the point  $(2, y)$  divides the join of  $(-4,3)$  and  $(6,3)$ .
20. If A, B and C are three points write the condition for collinearity.

### SECTION B

21. In figure PQ is a tangent to a circle with center O. If  $\angle OAB = 30^\circ$ , find  $\angle ABP$  and  $\angle AOB$ .



22. A metallic solid sphere of radius 4.2 cm is melted and recasted into a solid cylinder of radius 6cm. Find the height of the cylinder.
23. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting

- a) "2" of spade                      b) a queen of black suit

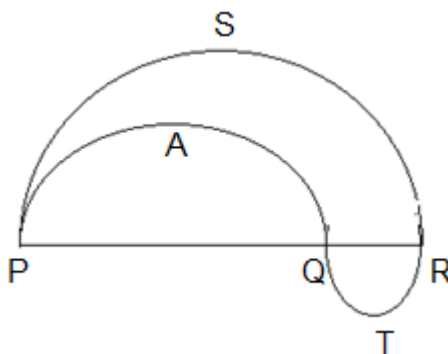
**OR**

Two dice are thrown together. Find the probability the product of the numbers on the top of the dice is    a) 7    b) 12

24. A pole casts a shadow of length  $2\sqrt{3}m$  on the ground, when the sun's elevation is  $60^\circ$ . Find the height of the pole.  
 25. Find the HCF of 240 and 228 using Euclid's Division Algorithm.  
 26. Given  $\Delta ABC \sim \Delta DEF$ . If  $ar(\Delta ABC) = 100cm^2$  and  $ar(\Delta DEF) = 196cm^2$  and  $DE = 7cm$ , find  $AB$ .

### SECTION C

27. In figure PSR, RTQ and PAQ are three semi-circles of diameters 10cm, 3cm and 7cm. Find the area of the shaded region.



28. Evaluate  $\frac{\tan^2 60^\circ + 4 \cos^2 45^\circ + 3 \operatorname{cosec}^2 60^\circ + 2 \cos^2 90^\circ}{2 \operatorname{cosec} 30^\circ + 3 \sec 60^\circ - \frac{7}{3} \cot^2 30^\circ}$

**OR**

If  $\tan 2\theta = \cot(\theta + 6^\circ)$  where  $2\theta$  and  $(\theta + 6^\circ)$  are acute angles, find the value of  $\theta$

29. Check whether -150 is a term of the A.P 11, 8, 5, 2, .....?

**OR**

If 10 times the 10<sup>th</sup> term of an A.P is equal to the 15<sup>th</sup> times the 15<sup>th</sup>, show that its 25<sup>th</sup> term is 0.

30. Check whether  $x^2 + 2x + 2$  is a factor of  $x^4 + 3x^3 + 7x^2 + x + 13$ ?

31. Prove that  $5 - \sqrt{3}$  is irrational number, given  $\sqrt{3}$  is irrational.

**OR**

An army contingent of 616 members is to march behind an army band of 32 members in a parade. The 2 groups are to march in the same number of columns. What is the maximum number of columns in which they can march?

32. In a school, 300 students participated for sports day. Their ages are given in the following distribution.

Age (in yrs)	5-7	7-9	9-11	11-13	13-15	15-17	17-19
No:of students	67	33	41	95	36	13	15

Find the mode of the following data.

33. Find the point which divides the line segment joining the points (8, -9) and (2, 3) in the ratio 1:2.  
 34. Solve the given pair of linear equation by cross multiplication method.  
 $x - 5y + 10 = 0$  and  $3x - 10y - 30 = 0$

### SECTION D

35. The circular ends of a bucket are of radii 35cm and 14cm and the height of the bucket is 40cm. Find its volume and C.S.A.

36. Construct an isosceles triangle whose base is 8cm and altitude is 4cm and then another triangle whose sides are  $1\frac{1}{2}$  times the corresponding sides of the isosceles triangle. Write the steps of construction.

**OR**

Draw a pair of tangents to circle of radius 5cm which are inclined to each other at an angle of  $60^\circ$ .

37. State and prove Basic proportionality theorem (BPT)  
38. A train travels 360 km at a uniform speed. If speed had been 5km/hr more it would have taken 1 hr less for the same journey. Find the speed of the train.  
39. Find the value of x and y if the median for the data is 31.

Classes	0-10	10-20	20-30	30-40	40-50	50-60	Total
Frequency	5	x	6	y	6	5	40

**OR**

Draw a more than ogive for the below given data and find the median graphically.

Classes Interval	0-20	20-40	40-60	60-80	80-100	100-120	120-140
Frequency	6	8	10	12	6	5	3

40. A 7m long flagstaff is fixed on the top of a tower standing on the horizontal plane. From a point on the ground, angles of elevation of the top and bottom of the flagstaff are  $60^\circ$  and  $45^\circ$ . Find the height of the tower correct to one decimal place [Use  $\sqrt{3} = 1.73$ ]