Practice Paper 4
Mathematics X
Published on 18-10-2017

80 Marks

2 hours 30 minutes

SECTION A

Answer any 2 in the section A. Each carries 1 mark

1. What is the first term of the sequence whose algebraic form $-3n+5$?
   a) -3 *b*) 2 *c*) 5 *d*) 1

2. A cube of maximum size is carved from a wooden sphere. If the volume of the cube is 27cm^3then what is the radius of the sphere
)*a* $3\sqrt{3}$ *b*) $\frac{3}{2}\sqrt{3}$ *c*) $\sqrt{3}$ *d*) 1

3. Which of the following is on y axis ?
   a) $(-3,0)$ *b*) $(-2,-3)$ *c*) $(0,-3)$ *d*) $(1,1)$

SECTION B

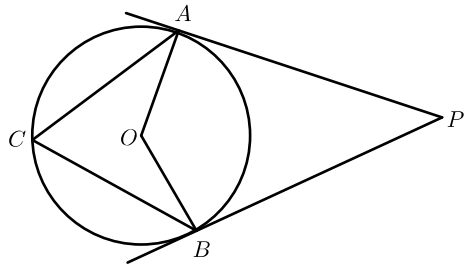
Answer any 4 in the section B. Each carries 2 mark

4. Draw a rectangle in a circle of radius 3cm having one side 4cm .Write the principle of construction

5. Perfect squares below 100 are placed in small paper pieces and placed in a box. One paper piece is taken at random. What is the probability of getting an even number

6. When the sides of a square are increased by 1 we get another square of area 144square centimeter. What will be the side of the first square? What is its diagonal?

7. In the figure PA, PB are the tangents. If the measure of angle $ACB$is $70°$,then find angle AOB and angle APB



8. $x-1$ is a factor of $ax^2-2bx+c$. Prove that a, b, c are in the arithmetic sequence

9. Atmospheric temperature in a city are given below .

   $$30°C, 27°C, 31°C, 28°C, 31°C, 27°C, 30°C$$

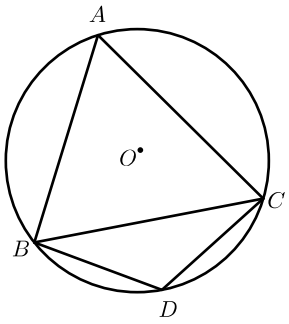
   Calculate the median

SECTION C

Answer any 6 in the section C. Each carries 3 mark

10. The sum of first n terms of a sequence is $7n^2+6n$. Find the first term and common difference. Write the sequence and its algebraic form

11. In the figure$BD = DC$,$\angle DBC = 30°$. find BDC. Find angle $BAC$and the central angle of arc BDC



12. The difference between two numbers is 4. The difference between its reciprocals is $\frac{4}{21}$. Find the numbers

13. One vertex of an equilateral triangle is in the origin.Other vertex is $(3, \sqrt{3}$. Calculate the side of the triangle . Write the coordinate of the third vertex on y axis y

14. Find the coordinates of the point where the line $x-2y+2=0$cut $x$axis and$y$ axis. Calculate the slope of this line

15. A cone of height 16cm and maximum size is carved from a wooden sphere of radius 10cm . What fraction of the volume of the sphere is that of the cone ?

16. Write x^3-2x^2-5x+6 as the product of three first degree factors

17. Write the values of $\sin 35, \cos 2, \cos 84, \sin 15$

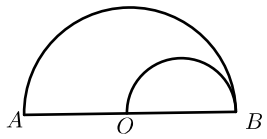
SECTION D

Answer any 8 in the section D. Each carries 4 mark

18. Write the algebraic form of the sequence $\frac{11}{8}, \frac{14}{8}, \frac{17}{8} \cdots$. write the sequence of its integral terms of this sequencest. What is its first three digit integral terms .Calculate the sum of all integral terms below 100

19. Draw a circle of radius 4cm . Draw a triangle having two angles $30°, 70°$ and its vertices on the circle

20. AB is the diameter of a semicircle. Another semicircle is drawn with OB as the diameter.A fine dot is placed into the figure at random. Calculate the probability of falling the dot in between the semicircles



21. The speed of boat in still water is 18km/h. The time taken for the boat to travel 24km upstream is 1hour more than the time taken for the boat to travel the same distance in the downstream. Calculate the speed of the stream

22. On observing from the top of a light house of height 75meter two boats one behind the other can be seen at the angle of elevation $40°$ and $30°$.Calculate the distance between the boats

23. The angles of a triangle are$40°, 60°, 80°$.Tangents are drawn at the vertices of the triangle to its circumcircle. Find the angles of the triangle formed by the tangents. Is this triangle similar to the first triangle ?

24. The radius of a cylinder made in wax is 6cm. A cone having same radius and height is carved from this cylinder. Calculate the volume of the so formed. How many cylindrical candles of radius 1cm and height 12cm that can be made from the temaining wax ?

25. $p(x) = x^3 + ax^2 + bx + cp(0) = 3$. $p(x)$has a factor$(x^2 - 1)$. Find a, b, c

26. $A(1, 3), B(7, 12)$ are the ends of its diameter. If $p(x, y)$is a point on the circle .Find the slopes of PA, PB. Calculate the product of its slopes .Using this find the equation of the circle. Also find the radius and center of the circle

27. The following are the weights of40children in a class . Calculate the median

ഭാരം കിലോഗ്രാം	കുട്ടികളുടെ എണ്ണം
38	5
39	7
41	8
43	11
44	6
45	3

SECTION E

Answer any 4 in the section E. Each carries 5 mark

28. Write the algebraic form of the sequence$20, 19\frac{1}{3}, 18\frac{2}{3} \cdots$.Find the sum of first n terms of this sequence. How many terms from the beginning of the sequence makes the sum 300. Expalain the situation to get two answers to get get this sum

29. In triangle ABC, $\angle A = 120°, \angle B = 30°, AB =$ 6cm . Draw triangle and construct its incircle.

30. Write $2x^2 - 11x - 6$as $k(x - a)(x - b)$ .Find the solution of $2x^2 - 11x - 6 = 0$

31. In triangle ABC, AC = 18cm ,angle A = $40°$,angle $C = 30°$.What is the measure of B? Find the length of altitude from A to BC. Calculate the length of BC. Calculate the area of ABC.

32. There is an open conical vessel having height 8cm and radius 5cm. It is filled with water. When some small metallic balls of radius 0.5cm is immersed in the water one fourth of water flows out . How many balls are placed in the vessel

33. Write the equation of the line passing through $A(3, 5), B(1, 2)$. At what point this line cut x axis . Write the equation of the line passing through this point and perpendicular to the line