CBSE Sample Papers for Class 10 SA2
Maths Solved 2016 Set 5

Roll   No.

- Please check that this question paper contains 5 printed pages .
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 31 questions.
- Please write down the Serial Number of the question before attempting it.
- 15 minutes time has been allotted to read this question paper.

MATHEMATICS

Time allowed : 3 hours   Maximum Marks : 90

General Instructions:

(i) All questions are compulsory.

(ii) The question paper consists of **31** questions divided into four sections — **A, B, C** and D.

(iii) Section **A** contains **4** questions of **1** mark each, Section **B** contains **6** questions of **2** marks each, Section **C** contains **10** questions of **3** marks each and Section **D** contains **11** questions of **4** marks each.

(iv) In question on construction, the drawing should he neat and exactly as per the given measurements.

(v) Use of calculators is not permitted.

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Section A

1. If $ax^2 + bx + c = 0$ has equal roots, what is the value of c?

2. For what value of k, are the numbers x, 2x + k and 3x + 6 three consecutive terms of an AP?

3. If the mid-point of the line segment joining the points P(6, b - 2) and Q(- 2, 4)   is (2, - 3),   find the value of b.

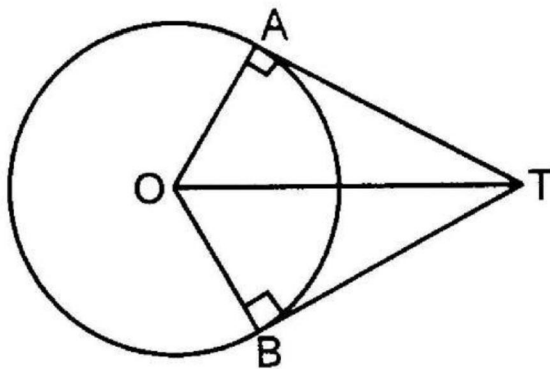4. In the fig O is the centre of a circle. The area of sector OAPB is 5/18 of the area of the circle. Find x.
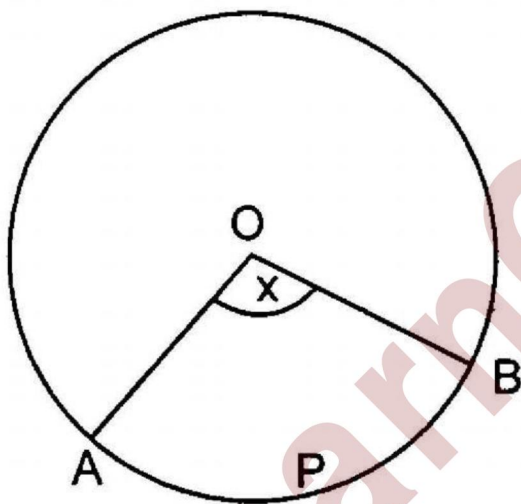
Section B

5. If one root of the quadratic equation $Ax^2 - px + 5 = 0$ is -3, find the value of Also find the other root.

6. Is -217 a term of the AP 27, 22, 17, 12, ...?

7.In fig. if ATO = 40°, find angle AOB.

8.A letter is chosen at random from the letters of word MATHEMATICS. Find the probability that the letter chosen is a vowel?

9.In given figure, a semicircle is drawn with O as centre and PQ as diameter. Semicircles are drawn with PO and OQ as diameters. If PQ = 56 cm, find the perimeter of the shaded region. (Use pi = 22/7)

10.Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 14 cm.(Use pi = 22/7)
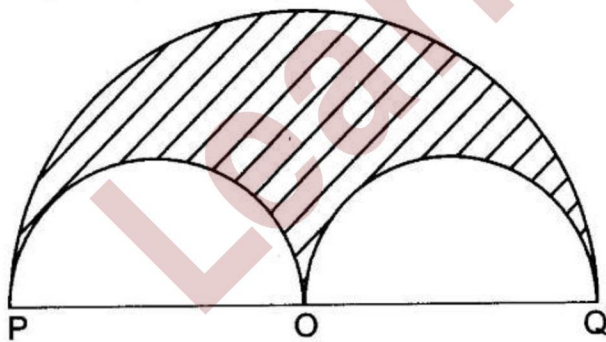
Section C

11.Speed of a boat in still water is 11 km/hour. It can go 12 km upstream and return downstream to the original point in 2 hours 45 minutes. Find the speed of the stream.

12.Solve for x:(x+2/x-2)+(x-4/ x+4) = 6 (x not equal to 2, - 4)

13.For what value of n, the nth terms of two AP's 59, 61, 63, ... and - 11, - 4, 3, 10, ... are equal.

14. Draw a right triangle in which the sides containing the right angle are 5 cm and 4 cm. Construct a similar triangle whose sides are times the sides of the above triangle.

15. Two dice are thrown simultaneously. What is the probability that
(a) 3 will not come up on either of them?
(b) 3 will come up on at least one?
(c) 3 will come up on both dice?

16. A bag contains 10 green balls and some red balls. If the probability of drawing a red ball is three times that of a green ball, determine the number of red balls in the bag.

17. If the point R(-2, 3) divides the line segment PQ in the ratio 3 : 4, where the coordinates of P are (1, 6), find the coordinates of Q.

18. The length of a line segment is 13 units and coordinates of one end points are (-6, 7). If the abscissa of the other end is -1, find the ordinate of the other end.

19. In figure PQR is a quadrant of a circle of radius 28 cm and a semicircle is drawn with PR as diameter. Find the area of the shaded region.(Use pi = 22/7)
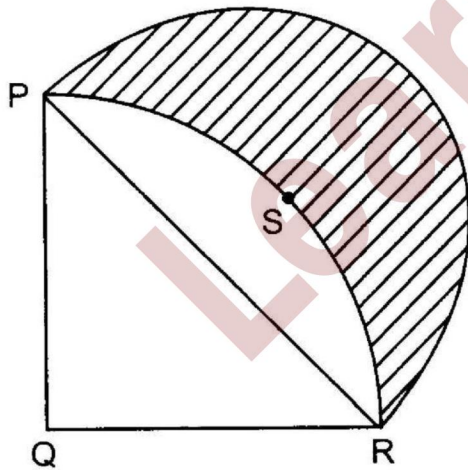
20. The rain water collected on the roof of a building, of dimensions 25 m x 30 m is drained into a cylindrical vessel having base diameter of 3 m and height 3.5 m. If the vessel is full up to the brim, find the height of the rain water on the roof.(Use pi = 22/7)

Section D

21. A tourist has ? 10,000 with him. He calculated that he could spend ? x everyday on his holidays. He spent ? (x - 50) everyday and extended his holidays by 10 days.
(a) Calculate x.
(b) Which value is depicted by the tourist?

22. The first and last terms of an AP are 6 and 348 respectively. If its common difference is 9, how many terms are there and what is their sum?

23. ABC is an isosceles triangle, in which AB = AC, circumscribed about a circle. Show that BC is bisected at the point of contact.

24. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

25. In figure, AB and CD are two parallel tangents to a circle with centre O. ST is tangent segment between the two parallel tangents touching the circle at Q. Show that SOT = 90°.
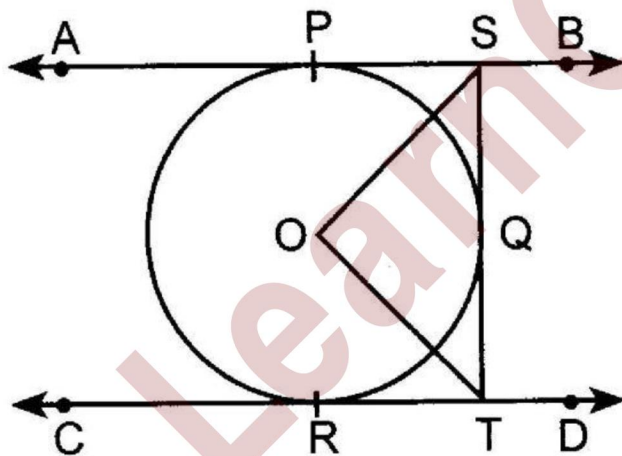
26. The angle of elevation of a jet fighter from a point A on the ground is 60°. After a flight of 15 seconds, the angle of elevation changes to 30°. If the jet is flying at a speed of 720 km/h, find the constant height at which it is flying.(root 3=1.73)

27. From the top of a tower 50 m high the angles of depression of the top and bottom of a pole are observed to be 45° and 60° respectively. Find the height of the pole.

28. Show that the points A(l, 2), B(5, 4), C(3, 8) and D(-l, 6) are the vertices of a square.

29.The area of an equilateral triangle in 49/3 cm². Taking each angular point as centre, circles are drawn with radius equal to half the length of the side of the triangle. Find the area of triangle not included in the circles. [Take root 3 = 1.73]

30.A sphere, of diameter 12 cm, 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-^ cm. Find the diameter of the cylindrical vessel.

31.A bucket open at the top is of the form of a frustum of a cone. The diameters of its upper and lower circular ends are 40 cm and 20 cm respectively. If total 17600 cm³ of water can be filled in the bucket, find its total surface area. [Use pi =22/7]