SUMMATIVE ASSESSMENT – II, 2014   [JS-20145]

MATHEMATICS /Class – X

Time allowed : 3 hours   Maximum Marks : 90

SECTION–A

Question Numbers 1 to 8 carry 1 mark each

1]   The distance between two parallel tangents to a circle of radius 5 cm is

A.   9cm

B.   8cm

C.   5cm

D.   10cm

2]   The probability of occurrence of event A is denoted by P(A) so the range of P(A) is

A.   0<P(A)   1

B.   0   P(A)<1

C.   0<P(A)<1

D.   0   P(A)   1

3]   A tree is broken by the wind. The top struck the ground at an angle of 30° and at a distance of 30 metres from the foot of the tree. The height of the tree in metres is

A.   40

B.   35

C. 25

D. $30\sqrt{3}$

4] The area of a square ABCD, whose vertices are A(5,6),B(1,5),C(2,1) and D(6,2) is given

A. 7 sq. units

B. 10 sq. units

C. 34 sq. units

D. 17 sq. units

TUTORIAL

5] If the perimeter and area of a circle are numerically equal, then the radius of the circle is

JSUNIL

CBSE

A. 7 units

B. 4 units

C. π units

D. 2 units

6] The ratio of the volume of a cube to that of a sphere which will exactly fit inside the cube is

A. 8: π

B. π : 6

SCIENCE

MATHS

C. π :8

D. 6: π

7] The first and last terms of an AP are 1 and 11. If the sum of all its terms is 36, then the number of terms will be

A. 8

B. 7

C. 5

D. 6

8]   The mid-point of the line segment joining P(-2,8) and Q(-6,-4) is
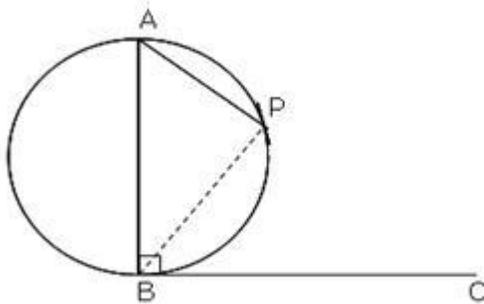
A.   (-4,-2)

B.   (4,-2)

C.   (4,2)

D.   (-4,2)

SECTION–B

Question Numbers 9 to 14 carry 2 marks each

9]   Find the roots of the equation $6x^2 - \sqrt{2}x – 2 = 0$ by the Factorization of the corresponding quadratic polynomial.

10]   AB is the chord of circle with centre O, BC is the tangent at B . As shown in the given figure. Show that∠PBC= ∠BAP.

11]   In given figure, PQL and PRM are tangents to the circle with centre O at the points Q and R respectively. S is a point on the circle such that $\angle$SQL =50° and $\angle$SRM=60°. Find the value of $\angle$QSR.
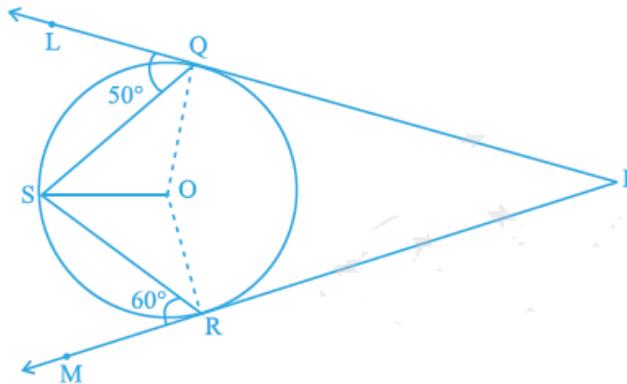
12]   Find the value of k for which 2k + 7, 6k – 2 and 8k + 4 form 3 consecutive terms of an AP.

13]   If d_1,d_2 ($d_2 > d_1$) are the diameters of two concentric circles and c is the length of a chord of a circle which is tangent to the other circle, then prove that $d_2^2 = c^2 + d_1^2$.

14. Find the value of k for which 2k + 7, 6k – 2 and 8k + 4 form 3 consecutive terms of an AP.]

SECTION–C

Question Numbers 15 to 24 carry 3 marks each

15. Solve for x :

$$\left(\frac{4x-3}{2x+1}\right) - 10\left(\frac{2x+1}{4x-3}\right) = 3 \quad \left(x \neq \frac{-1}{2}; x \neq \frac{3}{4}\right)$$

Or,

Divide 29 into two parts so that the sum of the squares of the two parts is 425.

16. A cone of maximum size is carved out from a cube of edge 14cm. Find the surface area of the cone and of the remaining solid left out after the cone is carved out.

17. At a point on level ground, the angle of elevation of a vertical tower is found to be such that its tangent is 5/12 . On walking 192 metres towards the tower, the tangent of the angle of elevation is 3/4. Find the height of the tower

18. The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

19. Given a rhombus ABCD in which AB=4cm and $\angle$ABC=60, divide it into two triangles say, ABC and ADC. Construct the triangle AB'C' similar to $\triangle$ABC with scale factor2/3 . Draw a line segment C'D' parallel to CD where D' lies on AD. Is AB'C'D' a rhombus? Give reasons.

20. If 7 times the 7th term of an A.P. is equal to 11 times its 11th term, show that the its 18th term is zero.

21 Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segments joining the points of contact at the centre.

22. Find the area of the shaded region in the given figure, where PQRS is a square and its side is 28cm, and four circles of equal radii are inscribed in it.
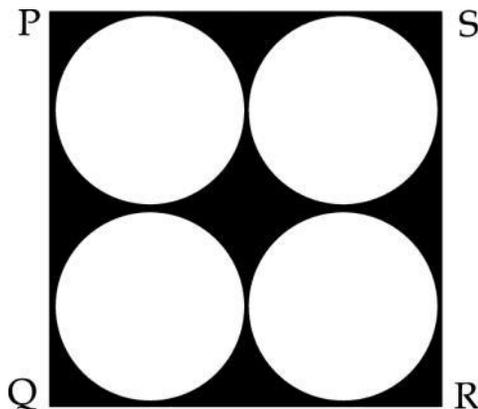
23. A semicircular sheet of metal of diameter 28 cm is bent into an open conical cup. Find the depth and capacity of the cup.

24. If A and B are (- 2, - 2) and (2, - 4) respectively. Find the co-ordinates of P such that AB and P lies on line segment BP = 4 /7 AB.

SECTION–D

Question Numbers 25 to 34 carry 3 marks each

25. In a class test, the sum of the marks obtained by X in mathematics and science is 28. Had he got 3 more marks in mathematics and 4 marks less in science, the product of the marks obtained in two subjects would have been 180. Find the marks obtained by him in two subjects separately

26. A hemispherical tank of radius 7/4m is full of water. It is connected by a cylindrical pipe which empties it at 7 litres per second. Find the time it will take to empty the whole tank.

27. A milk seller serves his customers using glasses shown in the figure. The inner diameter of the cylindrical glass is 7 cm and height 12 cm. The bottom of the glass has a raised hemispherical portion. Find the apparent and the actual capacities of the glass.
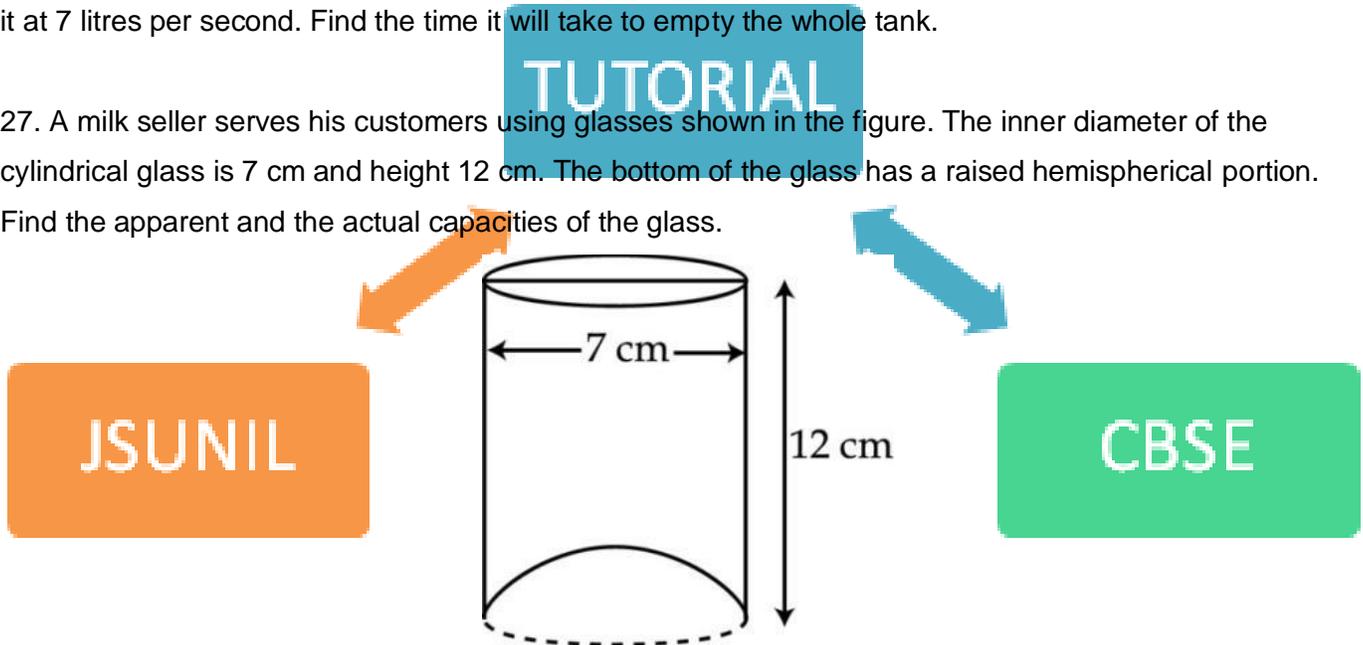
28. Two men on either side of a cliff 100 m high observe the angles of elevations of the top of the cliff to be 30^0 and 60^0 respectively. Find the distance between two men.

29. Find the area of triangle formed by joining the mid-points of the sides of triangle whose vertices are (0, -1), (2, 10) and (0, 3). Find the ratio of this triangle with given triangle.

30. A copper wire of 4 mm diameter is evenly wound about a cylinder whose length is 24 cm and diameter 20 cm so as to cover whole surface. Find the length and weight of the wire assuming the density to be 8.68 gm/cm^3.

31. A round balloon of radius r subtends an angle θ at the eye of the observer while the angle of elevation of its centre is ϕ. Prove that the height of the centre of the balloon is r sin ϕ.cosec θ/2.

.

32. A container is in the form of a frustum of a cone of height 30 cm with radii of its lower and upper ends as 10 cm and 20 cm respectively. Find the capacity and surface area of the container. Also, find the cost of the milk which can completely fill the container, at the rate of Rs 25 per litre (use π = 3.14).

33. There are a total 45 beads of blue, green, and white colour in a jar. The probability of selecting a blue bead is 1/3 and probability of selecting a green bead is 4/9 . How many white beads are there in the jar?

34. A solid toy is in the form of a hemisphere surmounted by a Right circular cone. The height of the cone is 4cm and the diameter of its base is 8 cm. Determine the volume of the toy. If a cube circumscribes the toy, then find the difference of the volumes of cube and the toy. Also, find the total surface area of the toy.