Class – X   Mathematics

GENERAL INSTRUCTIONS:

1.   All questions are compulsory.
2.   The question paper consists of thirty four questions divided into four sections A, B, C & D. Section A comprises of ten questions of 01 marks each, Section B comprises of eight questions of 02 marks each, Section C comprises of ten questions of 03 marks each and section D comprises of six questions of 04 marks each.
3.   All questions in section A are multiple choice questions where you are to select one correct option out of given four.
4.   There is no overall choice. However internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 04 mark each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculators is not permitted.

Section – 'A'

1.   If the roots of the equation $(b - c)x^2 + (c - a)x + (a - b) = 0$ are equal, then:
   (a) $2b = a + c$
   (b) $2a = b + c$
   (c) $2c = a + b$
   (d) $b = 2a + c$

2.   The roots of the quadratic equation $4y^2 - 1 = 0$ are:
   (a) $\pm \frac{1}{2}$
   (b) $\pm \frac{1}{2}$
   (c) $\pm \overline{2}$
   (d) $-\frac{1}{2}$

3.   The opposite sides of a quadrilateral ABCD circumscribing a circle subtend angles at the centre of the circle is:
   (a) $\angle AOB + \angle COD > 180°$
   (b) $\angle AOB + \angle COD < 180°$
   (c) $\angle AOB + \angle COD \geq 180°$
   (d) $\angle AOB + \angle COD \leq 180°$

4.   ABC is a right angled triangle with BC = 6cm and AB = 8cm. A circle with centre O & radius x cm has been inscribed in $\triangle ABC$. The value of x is:
   (a) $4cm$
   (b) $2cm$
   (c) $3cm$
   (d) $1.5cm$

5.   If TP & TQ are two tangents to a circle with centre O such that $\angle POQ = 60°$, then $\angle PTQ$ is:
   (a) $120°$
   (b) $100°$
   (c) $80°$
   (d) $60°$

6.   PA & PB are tangents to a circle with centre O are inclined to each other at an angle of 60°, the measure of $\angle POA$ is:
   (a) $60°$
   (b) $120°$
   (c) $80°$
   (d) $40°$

7.   If the radii of the ends of a bucket are $20cm$ and $8cm$ & its height is $16cm$, therefore slant height of it is:
   (a) $20cm$
   (b) $24cm$
   (c) $28cm$
   (d) $16cm$

Ashwani Gupta

 www.AshwaniGuptaMaths.weebly.com

ashwanigupta50@yahoo.com

gupta.ashwani50@gmail.com

**9810817270,
9811091238**

8. A pendulum swings to an angle of 30° & describes an arc $8.8 cm$ in length. The length of the pendulum is:
   (a) $15.8 m$
   (b) $16.8 m$
   (c) $16 m$
   (d) $15 m$

9. The angle of elevation of the top of a tower of height $100\ \sqrt{3}\ m$ from a point at a distance of $100\ m$ from the foot of the tower on a horizontal plane is:
   (a) 30°
   (b) 45°
   (c) 60°
   (d) 90°

10. A pair of dice is thrown once. The probability that neither a doublet nor a total of 7 will appear is:
    (a) $\dfrac{2}{3}$
    (b) $\dfrac{20}{27}$
    (c) $\dfrac{7}{36}$
    (d) $\dfrac{13}{36}$

Section – 'B'

11. The product of two consecutive positive integers is 306. We need to find the integers

12. Which term of the AP : 3, 15, 27, 39, . . . will be 132 more than its 54th term?

13. The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle.

14. The cost of fencing a circular field at the rate of Rs 24 per metre is Rs 5280. The field is to be ploughed at the rate of Rs 0.50 per m^2. Find the cost of ploughing the field.

15. A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness. Find the thickness of the wire

16. Find the ratio in which the *y*-axis divides the line segment joining the points (5, – 6) and (–1, – 4). Also find the point of intersection

17. If A and B are (– 2, – 2) and (2, – 4), respectively, find the coordinates of P such that $AP = 3/7 AB$ and P lies on the line segment AB.

18. 12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random from this lot. Determine the probability that the pen taken out is a good one.

"OR"

(a) A lot of 20 bulbs contain 4 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb is defective?

(b) Suppose the bulb drawn in (i) is not defective and is not replaced. Now one bulb is drawn at random from the rest. What is the probability that this bulb is not defective ?

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Ashwani Gupta

www.AshwaniGuptaMaths.weebly.com

ashwanigupta50@yahoo.com
gupta.ashwani50@gmail.com

9810817270,
9811091238

19. A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If the total cost of production on that day was Rs 90, find the number of articles produced and the cost of each article.

"OR"

Find two consecutive odd positive integers, sum of whose squares is 290.

Section – 'C'

20. How many terms of the AP : 24, 21, 18, . . . must be taken so that their sum is 78?

21. In fig: PQ is a chord of length 8 cm of a circle of radius 5 cm.
The tangents at P and Q intersect at a point T
Find the length TP.
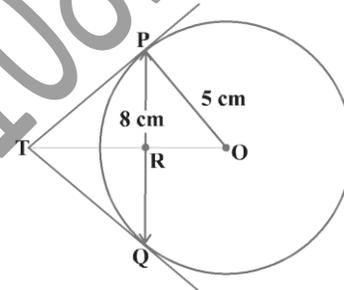
"OR"

A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively. Find the sides AB and AC.
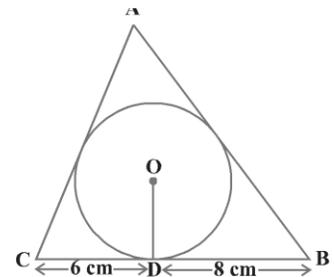
22. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60°.
23. A chord of a circle of radius 15 cm subtends an angle of 60° at the centre. Find the areas of the corresponding minor and major segments of the circle.(Use π = 3.14 and $\sqrt{3}$ = 1.73)
24. A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of Rs 500 per m^2.

"OR"

A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.

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25. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.

26. Determine the ratio in which the line $2x + y - 4 = 0$ divides the line segment joining the points A(2, - 2) and B(3, 7).

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

28. A box contains 12 balls out of which x are black. If one ball is drawn at random from the box, what is the probability that it will be a black ball?
   If 6 more black balls are put in the box, the probability of drawing a black ball is now double of what it was before. Find x.

Section – 'D'

29. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m. Find its length and breadth.

30. 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed and how many logs are in the top row?
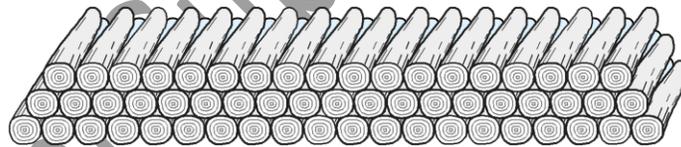
31. Find the area of the shaded design, where ABCD is a square of side 10 cm and semicircles are drawn with each side of the square as diameter. (Use π = 3.14)

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www.AshwaniGuptaMaths.weebly.com

ashwanigupta50@yahoo.com

gupta.ashwani50@gmail.com
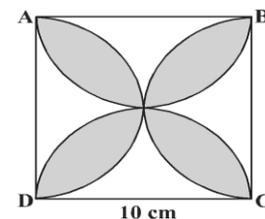
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32. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the total surface area of the article.
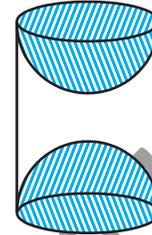
"OR"

A container shaped like a right circular cylinder having diameter 12 cm and height 15 cm is full of ice cream. The ice cream is to be filled into cones of height 12 cm and diameter 6 cm, having a hemispherical shape on the top. Find the number of such cones which can be filled with ice cream.

33. An open metal bucket is in the shape of a frustum of a cone, mounted on a hollow cylindrical base made of the same me- tallic sheet. The diameters of the two circular ends of the bucket are 45 cm and 25 cm, the total vertical height of the bucket is 40 cm and that of the cylindrical base is 6 cm. Find the area of the metallic sheet used to make the bucket, where we do not take into account the handle of the bucket. Also, find the volume of water the bucket can hold.
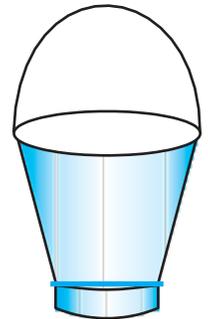
34. As observed from the top of a 75 m high lighthouse from the sea-level, the angles of depression of two ships are 30° and 45°. If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships.

M. C.Q. Answers:

1. a
2. a
3. d
4. b
5. a

6. a
7. a
8. b
9. c
10. a

other Questions are from NCERT. Check your textbook for answers.

For more MCQ's visit **www.AshwaniGuptaMaths.weebly.com**

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