

# CBSE Class 10 Maths Question Paper

CLASS X MATHS - 2012

## General Instructions:

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections A, B, C and D.
3. Section A contains 10 questions of 1 mark each, which are multiple choices type Questions, Section B contains 8 questions of 2 marks each, Section C contains 10 questions of 3 marks each, Section D contains 6 questions of 4 marks each.
4. There is no overall choice in the paper. However, internal choice is provided in one question of 2 marks, 3 questions of 3 marks each and two questions of 4 marks each.
5. Use of calculators is not permitted.

Q1. The length of shadow of a tower on the plane ground is  $\sqrt{3}$  times the height of the tower. The angle of elevation of sun is :

- A.  $45^\circ$
- B.  $30^\circ$
- C.  $60^\circ$
- D.  $90^\circ$

Q2. If the area of a circle is equal to sum of the areas of two circles of diameters 10 cm and 24 cm, then the diameter of the larger circle (in cm) is :

- A. 34
- B. 26
- C. 17
- D. 14

Q3. If the radius of the base of a right circular cylinder is halved, keeping the height the same, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is:

- A. 1 : 2
- B. 2 : 1
- C. 1 : 4
- D. 4 : 1

Q4. Two dice are thrown together. The probability of getting the same number on both dice is:

- A.  $\frac{1}{2}$
- B.  $\frac{1}{3}$
- C.  $\frac{1}{6}$
- D.  $\frac{1}{12}$

Q5. The coordinates of the point P dividing the line segment joining the points A (1, 3) and B (4, 6) in the ratio 2 : 1

- A. (2,4)
- B. (3,5)
- C. (4,2)
- D. (5,3)

Q6. If the coordinates of one end of a diameter of a circle are (2, 3) and the coordinates of its centre are (-2, 5), then the coordinates of the other end of the diameter are :

- A. (-6,7)
- B. (6,-7)
- C. (6,7)
- D. (-6,-7)

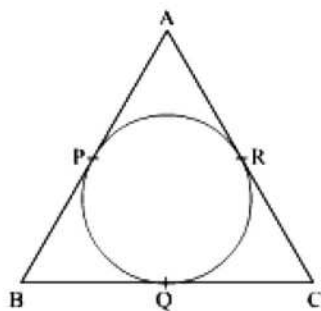
Q7. The sum of first 20 odd natural numbers is:

- A. 100
- B. 210
- C. 400
- D. 420

Q8. If 1 is a root of the equations  $ay^2 + ay + 3 = 0$  and  $y^2 + y + b = 0$  then ab equals :

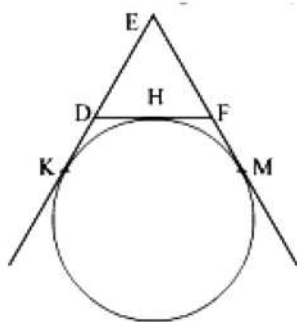
- A. 3
- B.  $-\frac{7}{2}$
- C. 6
- D. -3

Q9. In Fig. 1, the sides AB, BC and CA of a triangle ABC, touch a circle at P, Q and R respectively. If PA = 4 cm, BP = 3 cm and AC = 11 cm, then the length of BC (in cm) is :



- A. 11
- B. 10
- C. 14
- D. 15

Q10. In Fig 2, a circle touches the side DF of  $\triangle EDF$  at H and touches ED and EF produced at K and M respectively. If  $EK = 9$  cm, then the perimeter of  $\triangle EDF$  (in cm) is:



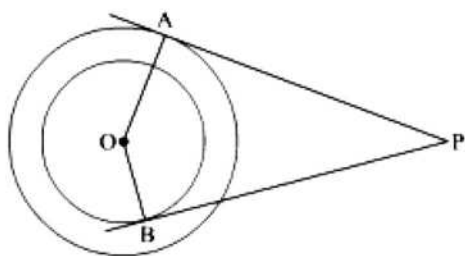
- A. 18
- B. 13.5
- C. 12
- D. 9

Q11. If a point A (0, 2) is equidistant from the points B (3, p) and C (p, 5), then find the value of p.

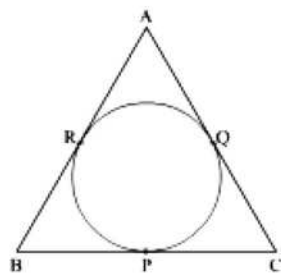
Q12. A number is selected at random from first 50 natural numbers. Find the probability that it is a multiple of 3 and 4.

Q13. The volume of a hemisphere is  $2425 \frac{1}{2} \text{ cm}^3$ . Find its curved surface area. [Use =  $\frac{22}{7}$ ]

Q14. Tangents PA and PB are drawn from an external point P to two concentric circles with centre O and radii 8 cm and 5 cm respectively, as shown in Fig.3. If  $AP = 15$  cm, then find the length of BP.

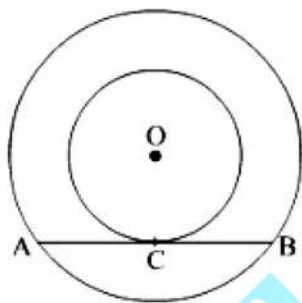


Q15. In Fig.4, an isosceles triangle ABC, with  $AB = AC$ , circumscribes a circle. Prove that the point of contact P bisects the base BC.

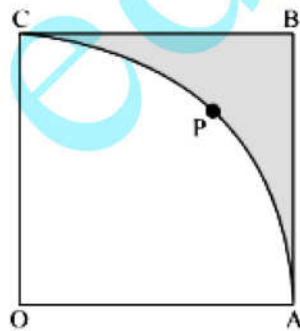


OR

In Fig.5, the chord AB of the larger of the two concentric circles, with centre O, touches the smaller circle at C. Prove that  $AC = CB$ .



Q16. In Fig.6, OABC is a square of side 7 cm. If OAPC is a quadrant of a circle with centre O, then find the area of the shaded regions. [Use  $= \frac{22}{7}$ ]



Q17. Find the sum of all three digit natural numbers, which are multiples of 7.

Q18. Find the value(s) of  $k$  so that the quadratic equation  $3x^2 - 2kx + 12 = 0$  has equal roots.

Q19. A point  $P$  divides the line segment joining the points  $A(3, -5)$  and  $B(-4, 8)$  such that  $\frac{AP}{PB} = \frac{k}{1}$ . If  $P$  lies on the line  $x + y = 0$ , then find the value of  $k$ .

Q20. If the vertices of a triangle are  $(1, -3)$ ,  $(4, p)$  and  $(-9, 7)$  and its area is 15 sq. units, find the value(s) of  $p$ .

Q21. Prove that the parallelogram circumscribing a circle is a rhombus.

**OR**

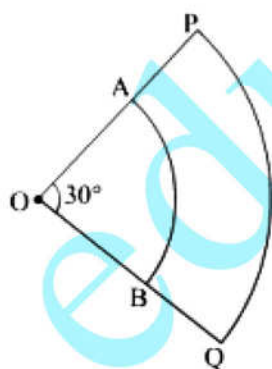
Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

Q22. From a solid cylinder of height  $7n$  cm and base diameter 12 cm, a conical cavity of same height and same base diameter is hollowed out. Find the total surface area of the remaining solid. [Use  $= \frac{22}{7}$ ]

**OR**

A cylindrical bucket, 32 cm high and with radius of base 18 cm, is filled with sand. This bucket is emptied on the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, then find the radius and slant height of the heap.

Q23. In Fig. 7,  $PQ$  and  $AB$  are respectively the arcs of two concentric circles of radii 7 cm and 3.5 cm and centre  $O$ . If  $\angle POQ = 30^\circ$ , then find the area of the shaded region. [Use  $= \frac{22}{7}$ ]



Q24. Solve for  $x$ :  $4x^2 - 4ax + (a^2 - b^2) = 0$

**OR**

Solve for  $x$ :  $3x^2 - 2\sqrt{6}x + 2 = 0$

Q25. A kite is flying at a height of 45 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is  $60^\circ$ . Find the length of the string assuming that there is no slack in the string.

Q26. Draw a triangle ABC with side  $BC = 6$  cm,  $\angle C = 30^\circ$  and  $\angle A = 105^\circ$ . Then construct another triangle whose sides are  $\frac{2}{3}$  times the corresponding sides of  $\triangle ABC$ .

Q27. The  $16^{\text{th}}$  term of an AP is 1 more than twice its  $8^{\text{th}}$  term. If the  $12^{\text{th}}$  term of the AP is 47, then find its  $n^{\text{th}}$  term.

Q28. A card is drawn from a well shuffled deck of 52 cards. Find the probability of getting (i) a king of red colour (ii) a face and (iii) the queen of diamonds.

Q29. A bucket is in the form of a frustum of a cone and it can hold 28.49 litres of water. If the radii of its circular ends are 28 cm and 21 cm, find the height of the bucket. [Use  $= \frac{22}{7}$ ]

Q30. The angle of elevation of the top of a hill at the foot of a tower is  $60^\circ$  and the angle of depression from the top of the tower to the foot of the hill is  $30^\circ$ . If the tower is 50 m high, find the height of the hill.

Q31. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

OR

A quadrilateral ABCD is drawn to circumscribe a circle. Prove that  $AB + CD = AD + BC$ .

Q32. A shopkeeper buys some books for Rs. 80. If he had bought 4 more books for the same amount, each book would have cost Rs 1 less. Find the number of books he bought.

OR

The sum of two numbers is 9 and the sum of their reciprocals is  $\frac{1}{2}$ . Find the numbers

Q33. Sum of first 20 terms of an AP is  $-240$ , and its first term is 7. Find its  $24^{\text{th}}$  term.

Q34. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 7 cm and the height of the cone is equal to its diameter. Find the volume of the solid. [Use  $= \frac{22}{7}$ ]