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CBSE 10th Mathematics 2013 Unsolved Paper

All India

TIME - 3HR. | QUESTIONS - 34

THE MARKS ARE MENTIONED ON EACH QUESTION

SECTION - A

Q.1. If the difference between the circumference and the radius of a circle is 37 cm, then using $\pi = \frac{22}{7}$, the circumference (in cm) of the circle is: *1mark*

- (A) 154
- (B) 44
- (C) 14
- (D) 7

Q.2 The angle of depression of a car, standing on the ground, from the top of a 75m high tower, is 30° . The Distance of the car from the base of the tower(in m.) is: *1mark*

- (A) $25\sqrt{3}$
- (B) $50\sqrt{3}$
- (C) $75\sqrt{3}$
- (D) 150

Q.3. The probability of getting an even number, when a die is thrown once, is: *1mark*

- (A) $\frac{1}{2}$
- (B) $\frac{1}{3}$
- (C) $\frac{1}{6}$
- (D) $\frac{5}{6}$

Q.4. In Fig. 1, PA and PB are two tangents drawn from an external point P to a circle with centre C and radius 4 cm. If $PA \perp PB$, then the length of each tangent is: *1mark*

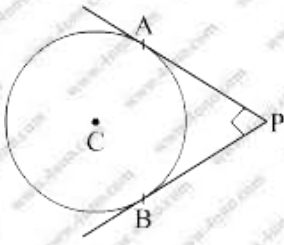


Fig. 1

- (A) 3 cm
- (B) 4 cm
- (C) 5 cm
- (D) 6 cm

Q.5. In Fig.2, a circle with centre O is inscribed in a quadrilateral ABCD such that, it touches the sides BC, AB, AD and CD at points P, Q, R and S respectively, If $AB = 29$ cm, 1mark

$AD = 23$ cm, $\angle B = 90^\circ$ and $DS = 5$ cm, then the radius of the circle (in cm.) is:

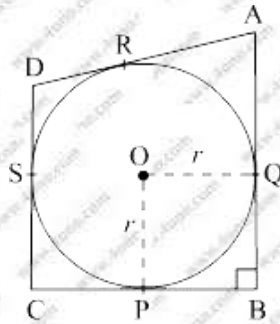


Fig. 2

- (A) 11
- (B) 18
- (C) 6
- (D) 15

Q.6. In Fig, the area of triangle ABC (in sq. units) is: 1mark

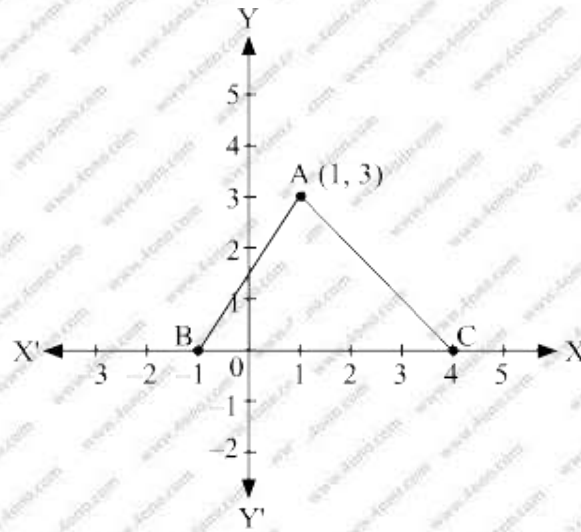


Fig. 3

- (A) 15
- (B) 10
- (C) 7.5
- (D) 2.5

Q.7. A box contains 90 discs, numbered from 1 to 90. If one disc is drawn at random from the box, the probability that it bears a prime-number less than 23, is : *1mark*

- (A) $\frac{7}{90}$
- (B) $\frac{10}{90}$
- (C) $\frac{4}{45}$
- (D) $\frac{9}{89}$

Q.8. The common difference of the AP $\frac{1}{2b}, \frac{1-6b}{2b}, \frac{1-12b}{2b}$ is: *1mark*

- (A) 2b
- (B) -2b
- (C) 3
- (D) -3

SECTION - B

Q.9. Two circular pieces of equal radii and maximum area, touching each other are cut out from a rectangular card board of dimensions $14 \text{ cm} \times 7 \text{ cm}$. Find the area of the remaining card board. [use $\pi = \frac{22}{7}$]. 2marks

Q.10. Solve the following quadratic equation for x: 2marks

$$4\sqrt{3}x^2 + 5x - 2\sqrt{3} = 0$$

Q.11. Prove that the parallelogram circumscribing a circle is a rhombus. 2marks

Q.12. How many three – digit natural numbers are divisible by 7? 2marks

Q.13. In Figure, a circle inscribed in triangle ABC touches its sides AB, BC and AC at points D, E and F respectively. If $AB = 12 \text{ cm}$, $BC = 8 \text{ cm}$ and $AC = 10 \text{ cm}$, then find the lengths of AD, BE and CF.

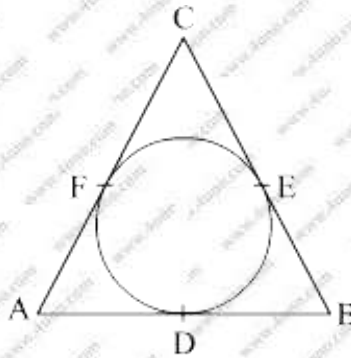


Fig. 4

Q.14. A die is tossed once. Find the probability of getting an even number or a multiple of 3. 2marks

SECTION - D

Q.15. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. 3marks

Find: (i) the length of the arc (ii) area of the sector formed by the arc [use $\pi = \frac{22}{7}$].

Q.16. A wooden toy was made by scooping out a hemisphere of same radius 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 volume of wood in the toy. [use $\pi = \frac{22}{7}$]. 3marks

Q.17. A vessel is in the form of hemispherical bowl surmounted by a hollow cylinder of same diameter. The diameter of the hemispherical bowl is 14 cm and the total height of the vessel is 13 cm. Find the total surface area of the vessel. [use $\pi = \frac{22}{7}$]. 3marks

Q.18. In Fig. 5, AB and CD are two diameters of a circle with centre O, which are perpendicular to each other. OB is the diameter of the smaller circle. If OA = 7 cm, find the area of the shaded region. [use $\pi = \frac{22}{7}$]. 3marks

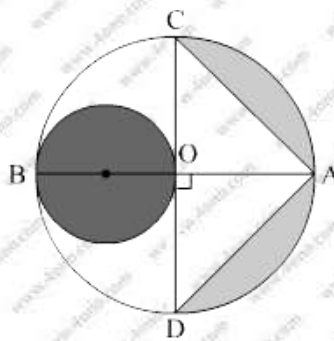


Fig. 5

Q.19. Find the ratio in which the y-axis divides the line segment joining the points $(-4, -6)$ and $(10, 12)$. Also find the coordinates of the point of division. 3marks

Q.20. The horizontal distance between two poles is 15 m. The angle of depression of the top of first pole as seen from the top of second pole is 30° . If the height of the second pole is 24 m, find the height of the first pole. [use $\sqrt{3} = 1.732$]. 3marks

Q.21. Prove that the points $A(0, -1)$, $B(-2, 3)$, $C(6, 7)$ and $D(8, 3)$ are the vertices of a rectangle ABCD? 3marks

Q.22. Draw a triangle PQR in which $QR = 6$ cm, $PQ = 5$ cm and $\angle PQR = 60^\circ$. Then construct another triangle whose sides are $\frac{3}{5}$ times the corresponding sides of ΔPQR ? 3marks

Q.23. The n th term of an AP is given by $(-4n + 15)$. Find the sum of first 20 terms of this AP. *3marks*

Q.24. For what value of k , the roots of the quadratic equation $kx(x - 2\sqrt{5}) + 10 = 0$ are equal? *3marks*

SECTION - D

Q.25. A bucket open at the top, and made up of a metal sheet is in the form of a frustum of a cone. The depth of the bucket is 24 cm and the diameters of its upper and lower circular ends are 30 cm and 10 cm respectively. Find the cost of metal sheet used in it at the rate of Rs 10 per 100 cm^2 . [Use $\pi = 3.14$] *4marks*

Q.26. Water is flowing through a cylindrical pipe, of internal diameter 2 cm, into a cylindrical tank of base radius 40 cm, at the rate of 0.4 m/s. Determine the rise in level of water in the tank in half an hour. *4marks*

Q.27. A group consists of 12 persons, of which 3 are extremely patient, other 6 are extremely honest and rest are extremely kind. A person from the group is selected at random. Assuming that each person is equally likely to be selected, find the probability of selecting a person who is (i) extremely patient (ii) extremely kind or honest. *4marks*

Which of the above values you prefer more?

Q.28. In Fig, l and m are two parallel tangents to a circle with centre O , touching the circle at A and B respectively. Another tangent at C intersects the line l at D and m at E . Prove that $\angle DOE = 90^\circ$ *4marks*

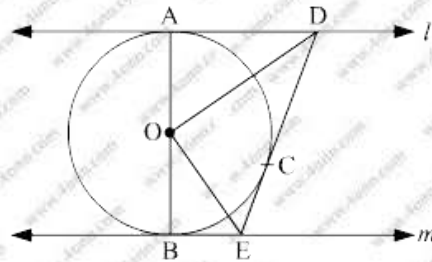


Fig. 6

Q.29. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact. *4marks*

Q.30. Sum of the areas of two squares is 400 cm^2 . If the difference of their perimeters is 16 cm, find the sides of the two squares. *4marks*

Q.31. Solve the following for x: *4marks*

$$\frac{1}{2a + b + 2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$$

Q.32. Find the value of x for which the points $(x, -1)$, $(2, 1)$ and $(4, 5)$ are collinear. *4marks*

Q.33. From a point P on the ground, the angle of elevation of the top of a 10 m tall building is 30° . A flagstaff is fixed at the top of the building and the angle of elevation of the top of the flagstaff from P is 45° . Find the length of the flagstaff and the distance of the building from the point P. (Take $\sqrt{3} = 1.73$) *4marks*

Q.34. The 24th term of an AP is twice its 10th term. Show that its 72nd term is 4 times its 15th term. *4marks*



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