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CBSE 10th Mathematics 2014 Unsolved Paper

All India

TIME - 3HR. | QUESTIONS - 34

THE MARKS ARE MENTIONED ON EACH QUESTION

SECTION - A

Q.1. If the height of a vertical pole is $\sqrt{3}$ times the length of its shadow on the ground, then the angle of elevation of the Sun at that time is. *1 mark*

- (A) 30°
- (B) 60°
- (C) 45°
- (D) 75°

Q.2. A bag contains cards numbered from 1 to 25. A card is drawn at random from the bag. The probability that the number on this card is divisible by both 2 and 3 is. *1 mark*

- (A) $\frac{1}{5}$
- (B) $\frac{3}{25}$
- (C) $\frac{4}{25}$
- (D) $\frac{2}{25}$

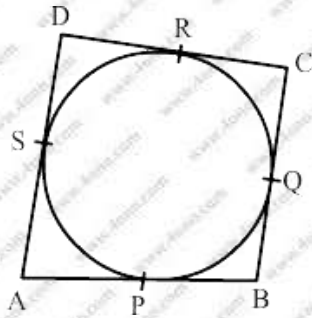
Q.3. Two different coins are tossed simultaneously. The probability of getting at least one head is. *1 mark*

- (A) $\frac{1}{4}$
- (B) $\frac{1}{8}$
- (C) $\frac{3}{4}$
- (D) $\frac{7}{8}$

Q.4. Two concentric circles are of radii 5 cm and 3 cm. Length of the chord of the larger circle (in cm), which touches the smaller circle is. 1 mark

- (A) 4
- (B) 5
- (C) 8
- (D) 10

Q.5. In Figure 1, a quadrilateral ABCD is drawn to circumscribe a circle such that its sides AB, BC, CD and AD touch the circle at P, Q, R and S respectively. If $AB = x$ cm, $BC = 7$ cm, $CR = 3$ cm and $AS = 5$ cm, find x . 1 mark



- (A) 10
- (B) 9
- (C) 8
- (D) 7

Q.6. The perimeter of a triangle with vertices $(0, 4)$, $(0, 0)$ and $(3, 0)$ is. 1 mark

- (A) $7 + \sqrt{5}$
- (B) 5
- (C) 10
- (D) 12

Q.7. A rectangular sheet of paper $40 \text{ cm} \times 22 \text{ cm}$, is rolled to form a hollow cylinder of height 40 cm. The radius of the cylinder (in cm) is. 1 mark

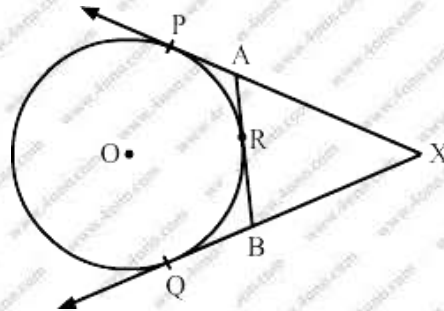
- (A) $3 \cdot 5$
- (B) 7
- (C) $\frac{80}{7}$
- (D) 5

Q.8. The next term of the A.P. $\sqrt{7}, \sqrt{28}, \sqrt{63}, \dots$ is. 1 mark

- (A) $\sqrt{70}$
 (B) $\sqrt{84}$
 (C) $\sqrt{97}$
 (D) $\sqrt{112}$

SECTION - B

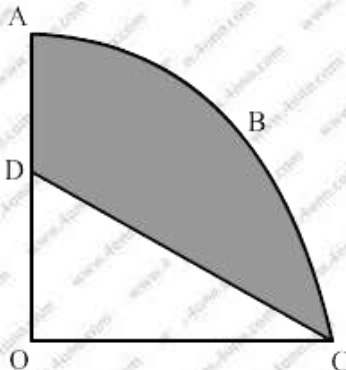
Q.9. In Figure 2, XP and XQ are two tangents to the circle with centre O, drawn from an external point X. ARB is another tangent, touching the circle at R. Prove that $XA + AR = XB + BR$. 2 marks



Q.10. Prove that the tangents drawn at the ends of any diameter of a circle are parallel. 2 marks

Q.11. Two different dice are rolled simultaneously. Find the probability that the sum of numbers appearing on the two dice is 10. 2 marks

Q.12. In Figure 3, OABC is a quadrant of a circle of radius 7 cm. If OD = 4 cm, find the area of the shaded region. [Use $\pi = \frac{22}{7}$]. 2 marks



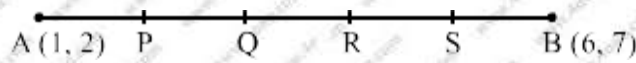
Q.13. Solve for x: 2 marks

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

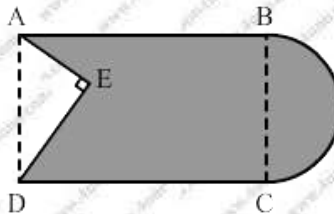
Q.14. The sum of the first n terms of an A.P. is $5n - n^2$. Find the n th term of this A.P. 2 marks

SECTION - C

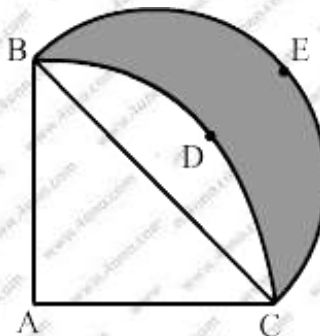
Q.15. Points P, Q, R and S divide the line segment joining the points A(1, 2) and B(6, 7) in 5 equal parts. Find the coordinates of the points P, Q and R. 3 marks



Q.16. In Figure 4, from a rectangular region ABCD with AB = 20 cm, a right triangle AED with AE = 9 cm and DE = 12 cm, is cut off. On the other end, taking BC as diameter, a semicircle is added on outside the region. Find the area of the shaded region. [Use $\pi = 3.14$]. 3 marks



Q.17. In Figure 5, ABCD is a quadrant of a circle of radius 28 cm and a semi circle BEC is drawn with BC as diameter. Find the area of the shaded region. $\left[Use \pi = \frac{22}{7}\right]$. 3 marks



Q.18. A 5m wide cloth is used to make a conical tent of base diameter 14 m and height 24 m. Find the cost of cloth used at the rate of Rs 25 per metre.

$$\left[Use \pi = \frac{22}{7}\right]. 3 \text{ marks}$$

Q.19. A girl empties a cylindrical bucket, full of sand, of base radius 18 cm and height 32 cm, on the floor to form a conical heap of sand. If the height of this conical heap is 24 cm, then find its slant height correct up to one place of decimal. 3 marks

Q.20. The sum of the first 7 terms of an A.P. is 63 and the sum of its next 7 terms is 161. Find the 28th term of this A.P. 3 marks

Q.21. Two ships are approaching a light-house from opposite directions. The angles of depression of the two ships from the top of the light-house are 30° and 45° . If the distance between the two ships is 100 m, find the height of the light-house. $[Use \sqrt{3} = 1.732]$. 3 marks

Q.22. If 2 is a root of the quadratic equation $3x^2 + px - 8 = 0$ and the quadratic equation $4x^2 - 2px + k = 0$ has equal roots, find the value of k . 3 marks

Q.23. Construct a triangle PQR, in which PQ = 6 cm, QR = 7 cm and PR = 8 cm. Then construct another triangle whose sides are $\frac{4}{5}$ times the corresponding sides of Δ PQR. 3 marks

Q.24. Find the value(s) of p for which the points $(p + 1, 2p - 2)$, $(p - 1, p)$ and $(p - 3, 2p - 6)$ are collinear. 3 marks

SECTION - D

Q.25. The mid-point P of the line segment joining the points A(-10, 4) and B(-2, 0) lies on the line segment joining the points C(-9, -4) and D(-4, y). Find the ratio in which P divides CD. Also find the value of y . 4 marks

Q.26. A quadrilateral is drawn to circumscribe a circle. Prove that the sums of opposite sides are equal. 4 marks

Q.27. The angle of elevation of the top of a chimney from the foot of a tower is 60° and the angle of depression of the foot of the chimney from the top of the tower is 30° . If the height of the tower is 40 m, find the height of the chimney. According to pollution control norms, the minimum height of a smoke emitting chimney should be 100 m. State if the height of the above mentioned chimney meets the pollution norms. What value is discussed in this question? *4 marks*

Q.28. A hemispherical depression is cut out from one face of a cubical block of side 7 cm, such that the diameter of the hemisphere is equal to the edge of the cube. Find the surface area of the remaining solid. $[Use \pi = \frac{22}{7}]$. *4 marks*

Q.29. If S_n denotes the sum of the first n terms of an A.P., prove that $S_{30} = 3(S_{20} - S_{10})$. *4 marks*

Q.30. A metallic bucket, open at the top, of height 24 cm is in the form of the frustum of a cone, the radii of whose lower and upper circular ends are 7 cm and 14 cm respectively. **Find:** *4 marks*

- (i) the volume of water which can completely fill the bucket.
- (ii) the area of the metal sheet used to make the bucket.

$$\left[Use \pi = \frac{22}{7}\right]$$

Q31. The sum of the squares of two consecutive even numbers is 340. Find the numbers. *4 marks*

Q.32. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact. *4 marks*

Q.33. A dice is rolled twice. Find the probability that *4 marks*

- (i) 5 will not come up either time.
- (ii) 5 will come up exactly one time.

Q.34. Solve for x: *4 marks*

$$3 \left(\frac{3x - 1}{2x + 3} \right) - 2 \left(\frac{2x + 3}{3x - 1} \right) = 5; x \neq \frac{1}{3}, -\frac{3}{2}$$



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