CBSE · CLASS 10 · MATHEMATICS (STANDARD)

CBSE Class 10 Mathematics (Standard) Guess Paper 2027

Time: 3 hours · Maximum marks: 80 · 38 questions

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Section A

20 questions of 1 mark each (18 MCQ + 2 Assertion-Reason)

Q1. Area of a segment of a circle of radius 'r' and central angle 60 degrees is : (A) (pi r^2)/2 - (1/2) r^2 (B) (2 pi r)/4 - (sqrt(3)/4) r^2 (C) (pi r^2)/6 - (sqrt(3)/4) r^2 (D) (2 pi r)/4 - r^2 sin 60 — 1 mark

Q2. A pair of dice is tossed. The probability of not getting the sum eight is (A) 5/36 (B) 31/36 (C) 5/18 (D) 5/9 — 1 mark

Q3. [3/4 $\tan^2$ 30 - $\sec^2$ 45 + $\sin^2$ 60] is equal to (A) -1 (B) 5/6 (C) -3/2 (D) 1/6 — 1 mark

Q4. If the lines given by 3x + 2ky = 2 and 2x + 5y + 1 = 0 are not parallel, then k has to be (A) 15/4 (B) not equal to 15/4 (C) any rational number (D) any rational number having 4 as denominator — 1 mark

Q5. The LCM of 960 and 240 is : (A) 960 (B) 240 (C) 60 (D) 15 — 1 mark

Q6. A point on the x-axis divides the line segment joining the points A(2,-3) and B(5,6) in the ratio 1:2. The point is A) (4,0) B) (7/2, 3/2) C) (3,0) D) (0,3) — 1 mark

Q7. If alpha and beta are two zeroes of a polynomial f(x) = px^2 - 2x + 3p and alpha + beta = alpha*beta, then value of p is : (A) -2/3 (B) 2/3 (C) 1/3 (D) -1/3 — 1 mark

Q8. In a bag containing 24 balls, 4 are blue, 11 are green and the rest are white. One ball is drawn at random. The probability that drawn ball is white in colour is A) 1/6 B) 3/8 C) 11/24 D) 5/8 — 1 mark

Q9. The distance of the point A(4a, 3a) from x-axis is : (A) 3a (B) -3a (C) 4a (D) -4a — 1 mark

Q10. If triangle ABC ~ triangle DEF, AB = 6cm, DE = 9cm, EF = 6cm and FD = 12cm, then the perimeter of triangle ABC is (A) 28cm (B) 28.5cm (C) 18cm (D) 23cm — 1 mark

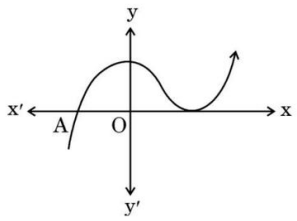
Q11. For any natural number n, 5^n ends with the digit : (A) 0 (B) 5 (C) 3 (D) 2 — 1 mark

Q12. From a point on the ground, which is 60 m away from the foot of a vertical tower, the angle of elevation of the top of the tower is found to be 45 degrees. The height (in metres) of the tower is : (A) 10 sqrt(3) (B) 30 sqrt(3) (C) 60 (D) 30 — 1 mark

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Q13. The graph of y = f(x) is given. The number of distinct zeroes of y = f(x) is : (A) 0 (B) 1 (C) 2 (D) 3 [Figure: curve crossing x-axis at A and touching it at another point] 1 mark

4. The graph of y = f(x) is given. The number of distinct zeroes of y = f(x) is :



(A) 0 (B) 1

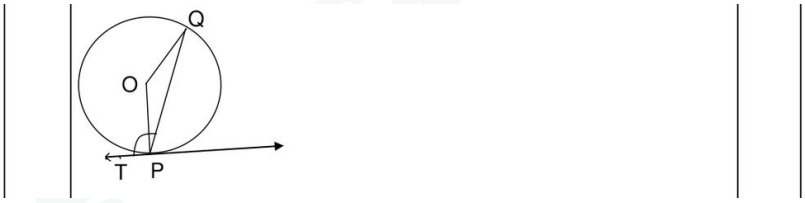
(C) 2 (D) 3

Q14. If 2sin(5x) = sqrt(3), 0 <= x <= 90 degrees, then x is equal to (A) 10 deg (B) 12 deg (C) 20 deg (D) 50 deg 1 mark

Q15. The median of a set of 9 distinct observations is 20.5. If each of the observations of the set is increased by 2, then the median of the new set (A) is increased by 2 (B) is decreased by 2 (C) is two times the original number (D) Remains same as that of original observations 1 mark

Q16. Which of the following gives the middle most observation of the data? A) Median B) Mean C) Range D) Mode 1 mark

Q17. In the given figure, a tangent has been drawn at a point P on the circle centred at O. If angle TPQ = 110 deg then angle POQ is equal to A) 110 deg B) 70 deg C) 140 deg D) 55 deg 1 mark



Q18. The curved surface area of a cone having height 24 cm and radius 7 cm, is (A) 528 cm^2 (B) 1056 cm^2 (C) 550 cm^2 (D) 500 cm^2 1 mark

Q19. Assertion (A) : The surface area of the cuboid formed by joining two cubes of sides 4 cm each, end-to-end, is 160 cm^2. Reason (R) : The surface area of a cuboid of dimensions l x b x h is (lb + bh + hl). [Choose: both true R explains A / both true R does not explain A / A true R false / A false R true] 1 mark

Q20. The tangents drawn at the extremities of the diameter of a circle are always : (A) parallel (B) perpendicular (C) equal (D) intersecting 1 mark

Section B

5 Very Short Answer questions of 2 marks each

Q21. Find the sum of first 30 terms of AP : -30, -24, -18, ... 2 marks

Q22. If AP and DQ are medians of triangles ABC and DEF respectively, where triangle ABC ~ triangle DEF, then prove that AB/DE = AP/DQ 2 marks

Q23. Find the zeroes of the polynomial $p(x) = x^2 + (4/3)x - 4/3$. 2 marks

Q24. If sin theta + cos theta = sqrt(3), then find the value of sin theta * cos theta. 2 marks

Q25. Find the point(s) on the x-axis which is at a distance of sqrt(41) units from the point (8, -5). 2 marks

Section C
6 Short Answer questions of 3 marks each

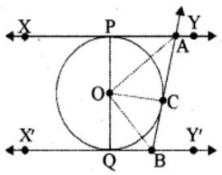
Q26. Solve the following system of equations graphically: 2x + y = 6, 2x - y - 2 = 0. Find the area of the triangle so formed by two lines and x-axis. [For Visually Impaired candidates: Five years hence, father's age will be three times the age of son. Five years ago, father was seven times as old as his son. Find their present ages.] 3 marks

Q27. Prove that sqrt(5) is an irrational number. 3 marks

Q28. Prove that the lengths of tangents drawn from an external point to a circle are equal. 3 marks

Q29. In Figure, XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that angle AOB = 90 degrees. [For Visually Impaired candidates: Two tangents PA and PB are drawn to a circle with centre O from an external point P. Prove that angle APB = 2(angle OAB)] 3 marks

(Section – C)
Section C consists of 6 questions of 3 marks each.

26.	In Figure, XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that ∠ AOB = 90°  **For Visually Impaired candidates:**	3

Q30. 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. 3 marks

Q31. Prove that (cosA - sinA + 1)/(cosA + sinA - 1) = cosecA + cotA 3 marks

Section D
4 Long Answer questions of 5 marks each

Q32. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio. 5 marks

Q33. A boy whose eye level is 1.35 m from the ground, spots a balloon moving with the wind in a horizontal line at some height from the ground. The angle of elevation of the balloon from the eyes of the boy at an instant is 60 deg. After 12 seconds, the angle of elevation reduces to 30 deg. If the speed of the wind is 3 m/s then find the height of the balloon from the ground. (Use sqrt(3) = 1.73) — 5 marks

Q34. If the mode of the following distribution is 55, then find the value of x. Hence, find the mean. Class Interval: 0-15, 15-30, 30-45, 45-60, 60-75, 75-90; Frequency: 10, 7, x, 15, 10, 12 — 5 marks

Q35. An empty cone of radius 3cm and height 12cm is filled with ice-cream such that the lower part of the cone which is (1/6)th of the volume of the cone is unfilled (empty) but a hemisphere is formed on the top. Find the volume of the ice-cream. — 5 marks

Section E

3 Case-study based questions of 4 marks each (sub-parts: two 1-mark + one 2-mark; the 2-mark sub-part carries the internal choice)

Q36. From a solid cylinder of height 30 cm and radius 7 cm, a conical cavity of height 24 cm and same radius is hollowed out. Find the total surface area of the remaining solid. — 4 marks

Q37. In Figure 1, a triangle ABC with angle B = 90 degrees is shown. Taking AB as diameter, a circle has been drawn intersecting AC at point P. Prove that the tangent drawn at point P bisects BC. — 4 marks

diameter, a circle has been drawn intersecting AC at point P. Prove that the tangent drawn at point P bisects BC. 4

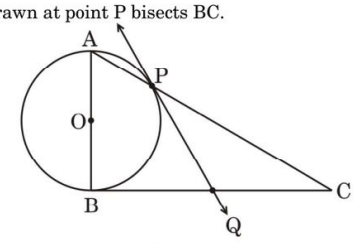


Figure 1

Q38. [case context: elder brother repays a bank loan of Rs 1,18,000 in monthly instalments starting at Rs 1,000 and increasing by Rs 100 every month (an AP)] Find the amount paid by him in the 30th instalment. — 4 marks

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