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CBSE SAMPLE QUESTION PAPER - II

MATHEMATICS (SA - II)

Time allowed : 3 hours ***Maximum Marks : 90***

General Instructions

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections A, B, C and D. Section A comprises of 8 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 10 questions of 3 marks each and Section D comprises of 10 questions of 4 marks each.
3. Question numbers 1 to 8 in Section A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice.
5. Use of calculator is not permitted.

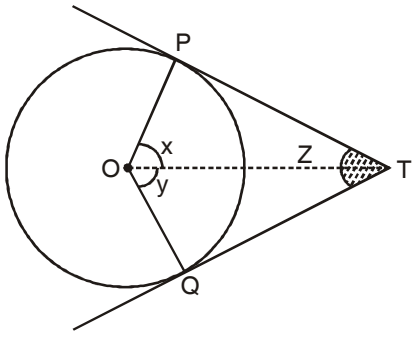
SECTION A

1. If one root of $2x^2 + kx + 1 = 0$ is $-\frac{1}{2}$, then the value of k is

   (a) 3 (b) –3

   (c) 5 (d) –5

2. In the figure, if TP and TQ are two tangents to a circle with centre O then x + y + z is



(a) 120° (b) 150°

(c) 180° (d) 360°

3. If two circles touch each other externally, then the number of common tangents are

(a) 4 (b) 3

(c) 2 (d) 1

4. The length of the shadow of a man is equal to the height of man, the angle of elevation is

(a) 90° (b) 60°

(c) 45° (d) 30°

5. If E be an event associated with a random experiment and $0 \leq P(E) \leq x$, then the value of x is :

(a) 0 (b) 1

(c) 2 (d) None of these

6. From the letter of the word "Education" a letter is selected, the probability that the letter is a vowel is :

(a) $\frac{7}{9}$ (b) $\frac{2}{9}$

(c) $\frac{4}{9}$ (d) $\frac{5}{9}$

7. The distance between two points A(7 sin 43°, 0) and B(0, 7 sin 47°) is :

(a) 7 (b) 49

(c) 1 (d) 0

8. The circumference of two circles are in the ratio 2 : 3, the ratio of their areas will be :

(a) 2 : 3 (b) 4 : 9

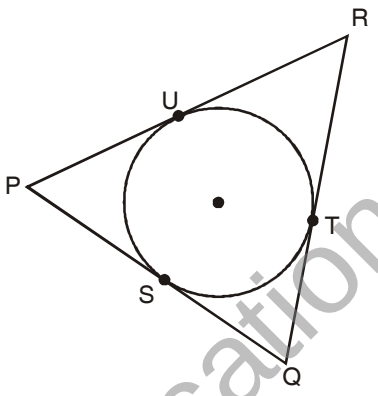
(c) 9 : 4 (d) 8 : 27

SECTION B

9. Find the value of m so that the quadratic equation $x^2 - 2x(1 + 3m) + 7(3 + 2m) = 0$ has equal roots.

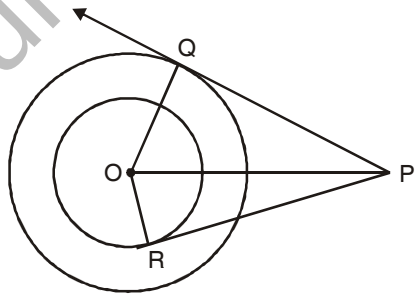
10. How many two digit numbers are there in between 6 and 102 which are divisible by 6 ?

11. A circle is inscribed in a ΔPQR having sides PQ = 10 cm, QR = 8 cm and PR = 12 cm.



Find PS and QT.

12. In the given figure, radii of two concentric circles are 5 cm and 8 cm. The length of tangent from P to bigger circle is 15 cm. Find the length of tangent to smaller circle.



13. A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is neither an ace nor a king.

14. Find the diameter of a circle whose area is equal to the sum of area of the two circles of radii 24 cm and 7 cm.

SECTION C

15. Solve the equation $2x^2 - 5x + 3 = 0$ by the method of completing the square.

16. Find the sum of first 15 terms of an A.P. whose n^{th} term is $9 - 5n$.

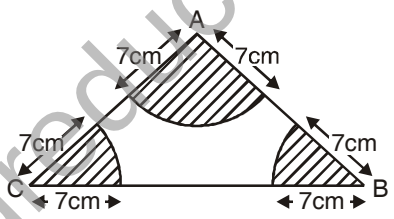
17. Draw a triangle ABC with side BC = 7 cm, $\angle B = 45°$, $\angle A = 105°$, Then, construct a triangle whose sides are $\frac{4}{3}$ times the corresponding sides of ΔABC.

18. As observed from the top of a 75 m high light house 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 light house, find the distance between the two ships.

19. Find a point on y-axis which is equidistant from the point (–2, 5) and (2, –3).

20. Find the ratio in which the y-axis divides the line segment joining the points (5, –6) and (–1, 4).

21. Find the area of shaded region in the following figure :



22. The numerical difference between circumference and diameter is 30 cm. What is the radius of the circle? $\left(\text{Take } \pi = \frac{22}{7}\right)$

23. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10km/h. How much area in hectares will it irrigate in 30 minute, if 8 cm of standing water is needed?
(1 hectare = 10000 m^2)

24. The total surface area of a solid right circular cylinder is 231 cm^2, its curved surface is $\frac{2}{3}$rd of the total surface area. Find the radius of the base and height.

SECTION D

25. Usha surveyed a class on World Food Day and observed that the number of students who like Junk food is 4 more than the number of students who like home made food. The sum of the squares of the number of two types of students is 400. Find the number of students who like Junk food and who like home made food?

26. If the sum of three consecutive terms of an increasing A.P. is 51 and the product of first and third terms is 273, find the third term.

27. An old lady Krishna Devi deposited Rs. 12000 in a bank at 8% simple interest p.a. She uses the annual interest to give five scholarships to the students of a school for their overall performances each year. The amount of each scholarship is ₹ 300 less than the preceding scholarship. Answer the following

    (i) Find amount of each scholarship?

    (ii) What values of the lady are reflected?

28. Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

29. A quadrilateral ABCD is drawn to circumscribe a circle, Prove that

    AB + CD = AD + BC.

30. An eagle is sitting on the top of a tower, which is 80m high. The angle of elevation of the eagle from a point on the ground is 45°. Th eagle flies away from the point of observation horizontally and remains at a constant height. After 2 seconds, the angle of elevation of the eagle from the point of observation become 30°. Find the speed of flying the eagle.

31. A bag contains some cards which are numbered between 31 and 96 are placed. If one card is drawn from the bag, find the probability that the number on card is :

    (i) a multiple of 3

    (ii) a perfect square

    (iii) a number not more than 40.

32. The slant height of a frustum of a cone is 4 cm and the perimeter of its circular ends are 18 cm and 6 cm. Find the curved surface area of the frustum.

33. If A(–5, 7), B(–4, –5), C(–1, –6) and D(4, 5) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.

34. A cone of radius 10 cm is divided into two parts by drawing a plane through the mid-point of its axis, parallel to its base, compare the volume of the two parts.

ANSWERS

1. a
2. c
3. d
4. c
5. b
6. d
7. a
8. b
9. $-\frac{10}{9}, 2$
10. 15
11. PS = 7 cm, QT = 3 cm
12. $2\sqrt{66}$ cm
13. $\frac{11}{13}$
14. 50 cm
15. $\frac{3}{2}, 1$
16. –465
18. $75\left(\sqrt{3}-1\right)$ m
19. (0, 1)
20. 5 : 1
21. 24.5 π cm^2
22. 7 cm
23. 56.25 hectares
24. 3.5 cm, 7 cm
25. 12, 16

26. 21

27. (i) ₹ 2520, ₹ 2220, ₹ 1920, ₹ 1620, ₹ 1320

(ii) Love for children, charity.

29. 29.28 m/sec.

31. (i) $\frac{5}{12}$ (ii) $\frac{1}{16}$ (iii) $\frac{9}{64}$

32. 48 cm^2

33. 72 square units 34. 1 : 7