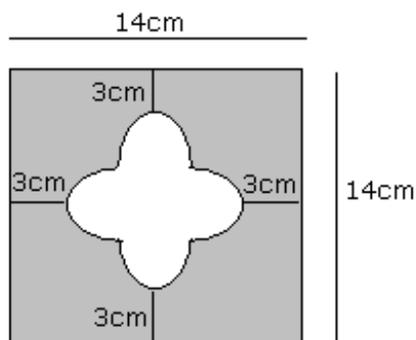




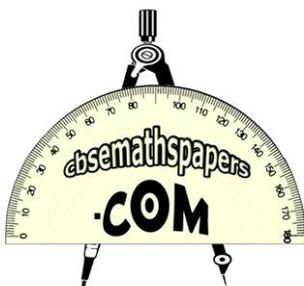
Paper prepared by **Dev Anoop**,
Mathematics Teacher, Bathinda (Punjab). Email: devanoop@devanoop.com
MM. 80 **Mock Test** **Time: 3 hours**
Attempt option 1 for challenging questions and 2 for easy-moderate questions

Section A 1 Mark Each

- If $a + b + c = 0$, $a \neq 0$ and a, b, c are real numbers then roots of equation $ax^2 + bx + c = 0$ are
(A) a, b (B) $c, 1$ (C) $\frac{b}{a}, 1$ (D) $1, \frac{c}{a}$
- If a, c, b are in A.P. then $a^3 + b^3 - 8c^3 =$
(A) $4abc$ (B) $8abc$ (C) $-8abc$ (D) none of these
- To divide a line segment AB in the ratio 4:7, a ray AX is drawn first such that $\angle BAX$ is an acute angle and then points A_1, A_2, A_3, \dots are located at equal distances on the ray AX and the point B is joined to
(A) A_{12} (B) A_{11} (C) A_{10} (D) A_9
- OABC is a rhombus 3 of whose vertices lie on a circle with centre O. If the area of rhombus is $128\sqrt{3}$ then radius of circle is
(A) 16cm (B) 32cm (C) 64cm (D) 128cm
- The world tangents was interduced by
(A) De moivre (B) Aryabhata (C) Pythagoras (D) Thomas fincke
- The area of shaded region in square cm is
(A) $180 - 8\pi$ (B) $180 - 32\pi$ (C) $196 - 8\pi$ (D) none of these



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7. The probability of getting a face card or 10 of spades when a card is drawn from a well shuffled deck of playing cards is
 (A) $\frac{3}{13}$ (B) 0.25 (C) $\frac{11}{52}$ (D) 0.33
8. A sphere and a cube have equal surface areas. The ratio of the volume of the sphere to that of cube is
 (A) $\sqrt{\pi} : \sqrt{6}$ (B) $\sqrt{6} : \sqrt{\pi}$ (C) $\sqrt{\pi} : \sqrt{12}$ (D) $\sqrt{12} : \sqrt{\pi}$
9. 2 boys are a metre apart and the height of one is twice the other if from the middle point of the line joining there feet the angles of alivation of there tops are complementry then the height of shorter boy is
 (A) $2\sqrt{2}$ (B) $\frac{1}{2\sqrt{2}}$ (C) $\frac{1}{2\sqrt{3}}$ (D) $2\sqrt{3}$
10. Two tangents making an angle of 120° with each other are drawn to a circle of radius 6 cm, Then the length of each tangent is equal to
 (A) $\sqrt{3}$ cm (B) $6\sqrt{3}$ cm (C) $\sqrt{3}$ cm (D) $2\sqrt{3}$ cm

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Section B 2 Marks Each

11. Find the value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$



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12. Find the sum of $\left(1 - \frac{1}{n}\right) + \left(1 - \frac{2}{n}\right) + \left(1 - \frac{3}{n}\right) + \dots$ upto n terms.
13. Let s denote the semi-perimeter of a triangle ABC in which $BC = a$, $CA = b$, $AB = c$. If a circle touches the sides BC, CA, AB at D, E, F, respectively, prove that $BD = s - b$.
14. The angle between two tangents to a circle may be 0° . Is it true? Give reason in support of your answer.
15. A sector of a circle of radius 15cm has the angle 120° . It is rolled up so that the 2 bounding radii are joined together to form a cone Find volume of cone. Leave your answer in root.
16. Name the type of quadrilateral formed, if any, by the following points, and give reasons for your answer: $(-3, 5)$, $(3, 1)$, $(0, 3)$, $(-1, -4)$
17. Find the area of a quadrilateral whose vertices taken in order are A $(-5, -3)$, B $(-4, -6)$, C $(2, -1)$ and D $(1, 2)$
18. In a leap year, find the probability of exactly 52 Mondays in the year

Section B 3 Marks Each

19. Show that the sum of first n even natural numbers is equal to $\left(1 + \frac{1}{n}\right)$ times the sum of first n odd natural numbers.
20. Draw a pair of tangents to a circle whose centre is not given.

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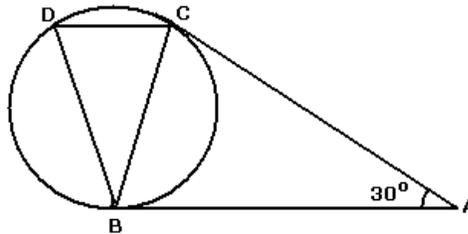
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21. In figure tangents AB and AC are drawn to a circle such that $\angle CAB = 30^\circ$. A chord CD is drawn parallel to the tangent AB. Find $\angle CBD$.



22. A cistern, internally measuring $150 \text{ cm} \times 120 \text{ cm} \times 110 \text{ cm}$, has 129600 cm^3 of water in it. Porous bricks are placed in the water until the cistern is full to the brim. Each brick absorbs one-seventeenth of its own volume of water. How many bricks can be put in without overflowing the water, each brick being $22.5 \text{ cm} \times 7.5 \text{ cm} \times 6.5 \text{ cm}$?

OR

A hemispherical depression is cut out from one face of a cubical wooden block such that the diameter r of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid. Leave your answer in π

23. Using coordinate geometry prove midpoint of hypotenuse of a right triangle is equidistant from the three vertices

OR

Determine the ratio in which the line $2x + y - 4 = 0$ divides the line segment joining the points A (2, -2) and B (3, 7).

24. Find the ratio in which the line joining the points (6, 4) and (1, -7) is divided by the x-axis. Also find the coordinates of the point.

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25. Two dice are thrown simultaneously what is the probability that (i) Sum of numbers on the dice is 2 or 3 or 4 or 5 (ii) Sum of numbers on the dice is 13

26. If the ratio of the roots of the equation $lx^2 + nx + n = 0$ is $a:b$ prove that $\sqrt{\frac{a}{b}} + \sqrt{\frac{b}{a}} + \sqrt{\frac{n}{l}} = 0$

OR

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

27. Two circles with centers O and O' of radii 3 cm and 4 cm respectively intersect at two points P and Q such that OP and $O'P$ are tangents to the two circles find the length of the common chord PQ .

OR

PQ is a chord of length 6 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T . Find the length TP .

28. If the roots of the equation $x^2 + 2cx + ab = 0$ are real and unequal, prove that the equation $x^2 - 2(a + b)x + a^2 + b^2 + 2c^2 = 0$ has no real roots.

OR

At t minutes past 3 pm, the time needed by the minutes hand of a clock to show

3:30 pm was found to be 10 minutes less than $\frac{t^2}{2}$ minutes. Find t .

Section D 4 Marks Each

29. A swimming pool is filled with 3 taps with uniform flow the first two taps operating together fill the pool in the same time in which it is filled by third tap alone. The second tap fills the pool five hours faster than the first tap and four hours slower than the third tap. Find the time required by each tap to fill the pool alone.

OR

A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?

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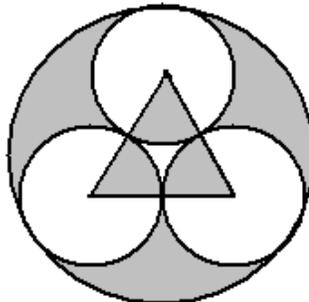
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Mock Test

Time: 3 hours

30. In figure each of the three smaller circles has radius 3cm and radius of bigger circle is R. Find R and the area of shaded region leave your answer in π



OR

Four circular flower beds have been added on four sides of a square lawn ABCD of side 56 m. If the centre of each circular flower bed is the point of intersection O of the diagonals of the square lawn, find the sum of the areas of the lawn and the flower beds.

31. A right circular cone is made of a sheet of cardboard and has height $3a$ and vertex angle 2θ . It contains 2 other right circular cones of height $2a$ and a and vertex angles 4θ and 6θ respectively find the ratio of 2 volumes in between the cones.

OR

A metallic right circular cone 40 cm high and whose vertical angle is 60° is cut into two parts at the middle of its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of diameter $\frac{2}{9}$ cm, find the length of the wire.

32. A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface of the remainder is $\frac{8}{9}$ of the curved surface of the whole cone, find the ratio of the line segments into which the altitude of the cone is divided by the plane.

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33. Along a road lie an odd number of stones placed at intervals of 10 meters. These stones have to be assembled around the middle stone. A person can carry only one stone at a time. A man carried the job with one of the end stones by carrying them in succession. In carrying all the stones he covered a distance of 3 km. Find the number of stones.

OR

A ladder has rungs 35 cm apart. The rungs decrease uniformly in length from 90 cm at the bottom to 35 cm at the top. If the top and the bottom rungs are $3\frac{3}{20}$ m apart, what is the length of the wood required for the rungs?

34. 2 stations due south of a leaning tower which leans towards the north are at distances a and b from its foot. If elevations of the top of tower from the stations are 45° and 30° respectively find $\cot \theta$ in terms of a and b, given the tower leans at an angle of θ to the horizontal.

OR

The lower window of a house is at a height of 4 m above the ground and its upper window is 8 m vertically above the lower window. At certain instant the angles of elevation of a balloon from these windows are observed to be 60° and 30° respectively. Find the height of the balloon above the ground.

Answers available on the same web page as Mock Test.

