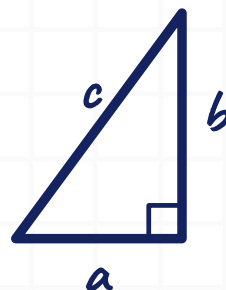
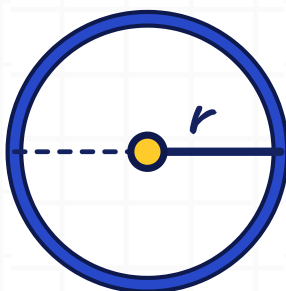


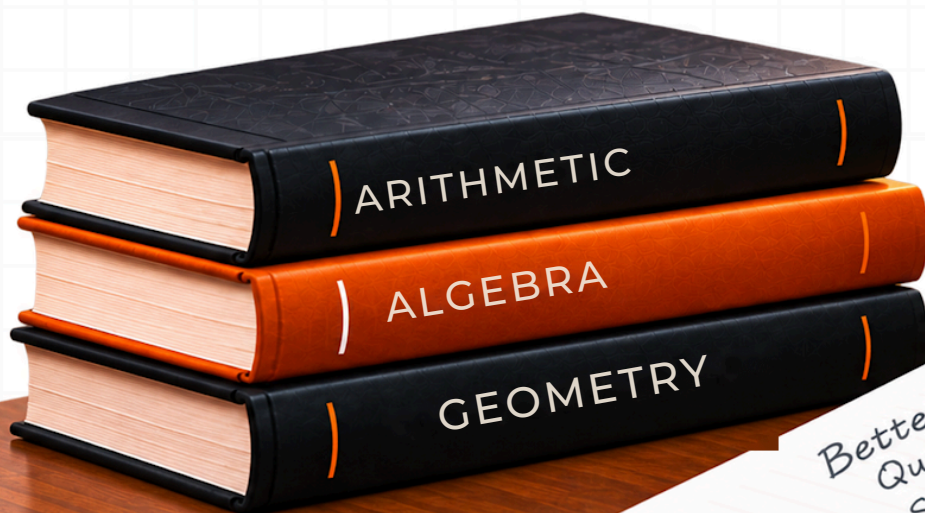
CAT PYQ

Geometry & Mensuration

$$a^2 + b^2 = c^2$$



$$D = S \times T$$



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Geometry & Mensuration CAT PYQ



Common Admission Test - Indian Institutes of Management

225 Questions

Quantitative Aptitude

Years: 1991-2025

General Instructions

- (i) This collection contains **225 Quantitative Aptitude** questions classified under **Geometry & Mensuration**, following the supplied CD PYQ sheet.
- (ii) **Coverage:** CAT 1991-2025. Questions are grouped by their source year and sitting, with continuous numbering from **1 to 225**.
- (iii) This collection has **197 multiple choice questions (MCQs)** and **28 Type In The Answer (TITA) questions**. Read every option before choosing the answer. Enter a response for questions marked "Type in the answer."
- (iv) All required shared passages and data sets for the selected questions are included. Blue range labels refer to the question numbers **in this collection**. Read the full passage, chart, table or conditions before answering.
- (v) Each question carries its original year or exam date, sitting where available, and source question number. References distinguish the two CAT 2003 sittings.
- (vi) Use this collection for practice. Follow the timing and marking scheme of the original sitting when attempting a timed exercise.
- (vii) Answer keys and solutions are not included. Passages and questions may continue onto the following page.

CAT 2025 Slot 1 - Questions 1-3

1. The (x, y) coordinates of vertices P, Q and R of a parallelogram PQRS are (-3, -2), (1, -5) and (9, 1), respectively. If the diagonal SQ intersects the x-axis at (a, 0), then the value of a is

30 Nov 2025, Slot 1, Q63

- (A) $\frac{27}{7}$ (B) $\frac{10}{3}$
(C) $\frac{13}{4}$ (D) $\frac{29}{9}$

2. In a circle with center C and radius $6\sqrt{2}$ cm, PQ and SR are two parallel chords separated by one of the diameters. If $\angle PQC = 45^\circ$, and the ratio of the perpendicular distance of PQ and SR from C is 3 : 2, then the area, in sq. cm, of the quadrilateral PQRS is

30 Nov 2025, Slot 1, Q64

- (A) $4(3 + \sqrt{14})$ (B) $4(3\sqrt{2} + \sqrt{7})$
(C) $20(3 + \sqrt{14})$ (D) $20(3\sqrt{2} + \sqrt{7})$

3. If the length of a side of a rhombus is 36 cm and the area of the rhombus is 396 sq. cm, then the absolute value of the difference between the lengths, in cm, of the diagonals of the rhombus is

30 Nov 2025, Slot 1, Q66

Type in the answer.

CAT 2025 Slot 2 - Questions 4-6

4. Two tangents drawn from a point P and a circle with center O at point Q and R. Point A and B lie on PQ and PR, respectively, such that AB is also a tangent to the same circle. If $\angle AOB = 50^\circ$, then $\angle APB$, in degrees equals

30 Nov 2025, Slot 2, Q59

Type in the answer.

5. Let ABCDEF be a regular hexagon and P and Q be the midpoints of AB and CD, respectively. Then, the ratio of the areas of trapezium PBCQ and hexagon ABCDEF is

30 Nov 2025, Slot 2, Q61

- | | |
|----------|----------|
| (A) 6:19 | (B) 5:24 |
| (C) 6:25 | (D) 7:24 |

6. In $\triangle ABC$, points D and E are on the sides BC and AC, respectively. BE and AD intersect at point T such that $AD:AT=4:3$, and $BE:BT=5:4$. Point F lies on AC such that DF is parallel to BE. Then, $BD:CD$ is

30 Nov 2025, Slot 2, Q66

- | | |
|----------|----------|
| (A) 15:4 | (B) 11:4 |
| (C) 7:4 | (D) 9:4 |

CAT 2025 Slot 3 - Questions 7-9

7. A triangle ABC is formed with $AB = AC = 50$ cm and $BC = 80$ cm. Then, the sum of the lengths, in cm, of all three altitudes of the triangle ABC is

30 Nov 2025, Slot 3, Q58

Type in the answer.

8. ABCD is a trapezium in which AB is parallel to DC, AD is perpendicular to AB, and $AB = 3DC$. If a circle inscribed in the trapezium touching all the sides has a radius of 3 cm, then the area, in sq. cm, of the trapezium is

30 Nov 2025, Slot 3, Q63

- (A) 48 (B) $30\sqrt{3}$
(C) $36\sqrt{2}$ (D) 54

9. In $\triangle ABC$, $AB = AC = 12$ cm and D is a point on side BC such that $AD = 8$ cm. If AD is extended to a point E such that $\angle ACB = \angle AEB$, then the length, in cm, of AE is

30 Nov 2025, Slot 3, Q65

- (A) 20 (B) 16
(C) 18 (D) 14

CAT 2024 Slot 1 - Questions 10-12

10. ABCD is a rectangle with sides $AB = 56$ cm and $BC = 45$ cm, and E is the midpoint of side CD. Then, the length, in cm, of radius of incircle of $\triangle ADE$ is

24 Nov 2024, Slot 1, Q57

Type in the answer.

11. In the XY-plane, the area, in sq. units, of the region defined by the inequalities $y \geq x + 4$ and $-4 \leq x^2 + y^2 + 4(x - y) \leq 0$ is

24 Nov 2024, Slot 1, Q58

(A) 2π

(B) 4π

(C) π

(D) 3π

12. The surface area of a closed rectangular box, which is inscribed in a sphere, is 846 sq cm, and the sum of the lengths of all its edges is 144 cm. The volume, in cubic cm, of the sphere is

24 Nov 2024, Slot 1, Q68

(A) 1125π

(B) 750π

(C) $1125\pi\sqrt{2}$

(D) $750\pi\sqrt{2}$

CAT 2024 Slot 2 - Questions 13-15

13. The coordinates of the three vertices of a triangle are: (1, 2), (7, 2), and (1, 10). Then the radius of the incircle of the triangle is

24 Nov 2024, Slot 2, Q48

Type in the answer.

14. Three circles of equal radii touch (but not cross) each other externally. Two other circles, X and Y, are drawn such that both touch (but not cross) each of the three previous circles. If the radius of X is more than that of Y, the ratio of the radii of X and Y is

24 Nov 2024, Slot 2, Q54

- (A) $7 + 4\sqrt{3} : 1$ (B) $4 + 2\sqrt{3} : 1$
(C) $4 + \sqrt{3} : 1$ (D) $2 + \sqrt{3} : 1$

15. ABCD is a trapezium in which AB is parallel to CD. The sides AD and BC when extended, intersect at point E. If $AB = 2$ cm, $CD = 1$ cm, and perimeter of ABCD is 6 cm, then the perimeter, in cm, of $\triangle AEB$ is

24 Nov 2024, Slot 2, Q55

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

16. A circular plot of land is divided into two regions by a chord of length $10\sqrt{3}$ meters such that the chord subtends an angle of 120° at the center. Then, the area, in square meters, of the smaller region is

24 Nov 2024, Slot 3, Q52

(A) $20 \left(\frac{4\pi}{3} + \sqrt{3} \right)$
(C) $20 \left(\frac{4\pi}{3} - \sqrt{3} \right)$

(B) $25 \left(\frac{4\pi}{3} + \sqrt{3} \right)$
(D) $25 \left(\frac{4\pi}{3} - \sqrt{3} \right)$

17. A regular octagon ABCDEFGH has sides of length 6 cm each. Then the area, in sq. cm, of the square ACEG is

24 Nov 2024, Slot 3, Q61

(A) $72(2 + \sqrt{2})$
(C) $72(1 + \sqrt{2})$

(B) $36(1 + \sqrt{2})$
(D) $36(2 + \sqrt{2})$

18. The midpoints of sides AB, BC, and AC in $\triangle ABC$ are M, N, and P respectively. The medians drawn from A, B, and C intersect the line segments MP, MN and NP at X, Y, and Z, respectively. If the area of $\triangle ABC$ is 1440 sq cm, then the area, in sq cm, of $\triangle XYZ$ is

24 Nov 2024, Slot 3, Q66

Type in the answer.

CAT 2023 Slot 1 - Questions 19-21

19. Let C be the circle $x^2 + y^2 + 4x - 6y - 3 = 0$ and L be the locus of the point of intersection of a pair of tangents to C with the angle between the two tangents equal to 60° . Then, the point at which L touches the line $x = 6$ is

26 Nov 2023, Slot 1, Q61

- (A) (6, 6) (B) (6, 3)
(C) (6, 8) (D) (6, 4)

20. A quadrilateral ABCD is inscribed in a circle such that $AB : CD = 2 : 1$ and $BC : AD = 5 : 4$. If AC and BD intersect at the point E, then $AE : CE$ equals

26 Nov 2023, Slot 1, Q62

- (A) 2 : 1 (B) 1 : 2
(C) 8 : 5 (D) 5 : 8

21. In a right-angled triangle $\triangle ABC$, the altitude AB is 5 cm, and the base BC is 12 cm. P and Q are two points on BC such that the areas of $\triangle ABP$, $\triangle ABQ$ and $\triangle ABC$ are in arithmetic progression. If the area of $\triangle ABC$ is 1.5 times the area of $\triangle ABP$, the length of PQ, in cm, is

26 Nov 2023, Slot 1, Q63

Type in the answer.

CAT 2023 Slot 2 - Questions 22-24

22. A triangle is drawn with its vertices on the circle C such that one of its sides is a diameter of C and the other two sides have their lengths in the ratio $a : b$. If the radius of the circle is r , then the area of the triangle is

26 Nov 2023, Slot 2, Q61

(A) $\frac{abr^2}{2(a^2 + b^2)}$

(B) $\frac{2abr^2}{a^2 + b^2}$

(C) $\frac{4abr^2}{a^2 + b^2}$

(D) $\frac{abr^2}{a^2 + b^2}$

23. In a rectangle ABCD, $AB = 9$ cm and $BC = 6$ cm. P and Q are two points on BC such that the areas of the figures ABP, APQ, and AQCD are in geometric progression. If the area of the figure AQCD is four times the area of triangle ABP, then $BP : PQ : QC$ is

26 Nov 2023, Slot 2, Q62

(A) 1:2:4

(B) 1:2:1

(C) 2:4:1

(D) 1:1:2

24. The area of the quadrilateral bounded by the Y-axis, the line $x = 5$, and the lines $|x - y| - |x - 5| = 2$, is

26 Nov 2023, Slot 2, Q63

Type in the answer.

CAT 2023 Slot 3 - Questions 25-27

25. Let $\triangle ABC$ be an isosceles triangle such that AB and AC are of equal length. AD is the altitude from A on BC and BE is the altitude from B on AC. If AD and BE intersect at O such that $\angle AOB = 105^\circ$, then $\frac{AD}{BE}$ equals

26 Nov 2023, Slot 3, Q61

- (A) $\sin 15^\circ$ (B) $\cos 15^\circ$
(C) $2 \cos 15^\circ$ (D) $2 \sin 15^\circ$

26. A rectangle with the largest possible area is drawn inside a semicircle of radius 2 cm. Then, the ratio of the lengths of the largest to the smallest side of this rectangle is

26 Nov 2023, Slot 3, Q62

- (A) 2 : 1 (B) 1 : 1
(C) $\sqrt{5} : 1$ (D) $\sqrt{2} : 1$

27. In a regular polygon, any interior angle exceeds the exterior angle by 120 degrees. Then, the number of diagonals of this polygon is

26 Nov 2023, Slot 3, Q63

Type in the answer.

CAT 2022 Slot 1 - Questions 28-30

28. A trapezium $ABCD$ has side AD parallel to BC , $\angle BAD = 90^\circ$, $BC = 3$ cm and $AD = 8$ cm. If the perimeter of this trapezium is 36 cm, then its area, in sq. cm, is

27 Nov 2022, Slot 1, Q50

Type in the answer.

29. All the vertices of a rectangle lie on a circle of radius R . If the perimeter of the rectangle is P , then the area of the rectangle is

27 Nov 2022, Slot 1, Q57

(A) $\frac{P^2}{16} - R^2$

(B) $\frac{P^2}{8} - 2R^2$

(C) $\frac{P^2}{2} - 2PR$

(D) $\frac{P^2}{8} - \frac{R^2}{2}$

30. Let $ABCD$ be a parallelogram such that the coordinates of its three vertices A , B , C are $(1, 1)$, $(3, 4)$ and $(-2, 8)$, respectively. Then, the coordinates of the vertex D are

27 Nov 2022, Slot 1, Q62

(A) $(0, 11)$

(B) $(4, 5)$

(C) $(-3, 4)$

(D) $(-4, 5)$

CAT 2022 Slot 2 - Questions 31-33

31. In triangle ABC, altitudes AD and BE are drawn to the corresponding bases. If $\angle BAC = 45^\circ$ and $\angle ABC = \theta$, then $\frac{AD}{BE}$ equals

27 Nov 2022, Slot 2, Q49

(A) $\sqrt{2} \cos \theta$

(B) $\frac{(\sin \theta + \cos \theta)}{\sqrt{2}}$

(C) 1

(D) $\sqrt{2} \sin \theta$

32. Regular polygons A and B have number of sides in the ratio 1 : 2 and interior angles in the ratio 3 : 4. Then the number of sides of B equals

27 Nov 2022, Slot 2, Q55

Type in the answer.

33. The length of each side of an equilateral triangle ABC is 3 cm. Let D be a point on BC such that the area of triangle ADC is half the area of triangle ABD. Then the length of AD, in cm, is

27 Nov 2022, Slot 2, Q66

(A) $\sqrt{8}$

(B) $\sqrt{6}$

(C) $\sqrt{7}$

(D) $\sqrt{5}$

CAT 2022 Slot 3 - Questions 34-36

34. Suppose the medians BD and CE of a triangle ABC intersect at a point O. If area of triangle ABC is 108 sq. cm., then, the area of the triangle EOD, in sq. cm., is

27 Nov 2022, Slot 3, Q49

Type in the answer.

35. The lengths of all four sides of a quadrilateral are integer valued. If three of its sides are of length 1 cm, 2 cm and 4 cm, then the total number of possible lengths of the fourth side is

27 Nov 2022, Slot 3, Q56

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

36. In a triangle ABC, $AB = AC = 8$ cm. A circle drawn with BC as diameter passes through A. Another circle drawn with center at A passes through B and C. Then the area, in sq. cm, of the overlapping region between the two circles is

27 Nov 2022, Slot 3, Q60

- | | |
|-------------------|-------------------|
| (A) 16π | (B) $16(\pi - 1)$ |
| (C) $32(\pi - 1)$ | (D) 32π |

CAT 2021 Slot 1 - Questions 37-39

37. If the area of a regular hexagon is equal to the area of an equilateral triangle of side 12 cm, then the length, in cm, of each side of the hexagon is

28 Nov 2021, Slot 1, Q46

- (A) $4\sqrt{6}$ (B) $6\sqrt{6}$
(C) $\sqrt{6}$ (D) $2\sqrt{6}$
-

38. Suppose the length of each side of a regular hexagon ABCDEF is 2 cm. It T is the mid point of CD, then the length of AT, in cm, is

28 Nov 2021, Slot 1, Q47

- (A) $\sqrt{13}$ (B) $\sqrt{14}$
(C) $\sqrt{12}$ (D) $\sqrt{15}$
-

39. A circle of diameter 8 inches is inscribed in a triangle ABC where $\angle ABC = 90^\circ$. If BC = 10 inches then the area of the triangle in square inches is

28 Nov 2021, Slot 1, Q58

Type in the answer.

CAT 2021 Slot 2 - Questions 40-42

40. If a rhombus has area 12 sq cm and side length 5 cm, then the length, in cm, of its longer diagonal is

28 Nov 2021, Slot 2, Q53

(A) $\sqrt{37} + \sqrt{13}$

(B) $\sqrt{13} + \sqrt{12}$

(C) $\frac{\sqrt{37} + \sqrt{13}}{2}$

(D) $\frac{\sqrt{13} + \sqrt{12}}{2}$

41. The sides AB and CD of a trapezium ABCD are parallel, with AB being the smaller side. P is the mid-point of CD and ABPD is a parallelogram. If the difference between the areas of the parallelogram ABPD and the triangle BPC is 10 sq cm, then the area, in sq cm, of the trapezium ABCD is

28 Nov 2021, Slot 2, Q55

(A) 30

(B) 40

(C) 25

(D) 20

42. Let D and E be points on sides AB and AC, respectively, of a triangle ABC, such that $AD : BD = 2 : 1$ and $AE : CE = 2 : 3$. If the area of the triangle ADE is 8 sq cm, then the area of the triangle ABC, in sq cm, is

28 Nov 2021, Slot 2, Q64

Type in the answer.

CAT 2021 Slot 3 - Questions 43-46

43. The cost of fencing a rectangular plot is ₹ 200 per ft along one side, and ₹ 100 per ft along the three other sides. If the area of the rectangular plot is 60000 sq. ft, then the lowest possible cost of fencing all four sides, in INR, is

28 Nov 2021, Slot 3, Q54

- (A) 120000 (B) 90000
(C) 100000 (D) 160000

44. A park is shaped like a rhombus and has area 96 sq m. If 40 m of fencing is needed to enclose the park, the cost, in INR, of laying electric wires along its two diagonals, at the rate of ₹125 per m, is

28 Nov 2021, Slot 3, Q55

Type in the answer.

45. If a triangle ABC, $\angle BCA = 50^\circ$. D and E are points on AB and AC, respectively, such that $AD = DE$. If F is a point on BC such that $BD = DF$, then $\angle FDE$, in degrees, is equal to

28 Nov 2021, Slot 3, Q59

- (A) 72 (B) 80
(C) 100 (D) 96

46. Let ABCD be a parallelogram. The lengths of the side AD and the diagonal AC are 10cm and 20cm, respectively. If the angle $\angle ADC$ is equal to 30° then the area of the parallelogram, in sq.cm is

28 Nov 2021, Slot 3, Q65

- (A) $\frac{25(\sqrt{5} + \sqrt{15})}{2}$ (B) $25(\sqrt{3} + \sqrt{15})$
(C) $\frac{25(\sqrt{3} + \sqrt{15})}{2}$ (D) $25(\sqrt{5} + \sqrt{15})$

CAT 2020 Slot 1 - Questions 47-50

47. A solid right circular cone of height 27 cm is cut into two pieces along a plane parallel to its base at a height of 18 cm from the base. If the difference in volume of the two pieces is 225 cc, the volume, in cc, of the original cone is

29 Nov 2020, Slot 1, Q56

- (A) 243 (B) 232
(C) 256 (D) 264

48. The area of the region satisfying the inequalities $|x| - y \leq 1$, $y \geq 0$ and $y \leq 1$ is

29 Nov 2020, Slot 1, Q57

Type in the answer.

49. On a rectangular metal sheet of area 135 sq in, a circle is painted such that the circle touches two opposite sides. If the area of the sheet left unpainted is two-thirds of the painted area then the perimeter of the rectangle in inches is

29 Nov 2020, Slot 1, Q58

- (A) $3\sqrt{\pi}(5 + \frac{12}{\pi})$ (B) $4\sqrt{\pi}(3 + \frac{9}{\pi})$
(C) $3\sqrt{\pi}(\frac{5}{2} + \frac{6}{\pi})$ (D) $5\sqrt{\pi}(3 + \frac{9}{\pi})$

50. A circle is inscribed in a rhombus with diagonals 12 cm and 16 cm. The ratio of the area of circle to the area of rhombus is

29 Nov 2020, Slot 1, Q59

- (A) $\frac{6\pi}{25}$ (B) $\frac{5\pi}{18}$
(C) $\frac{3\pi}{25}$ (D) $\frac{2\pi}{15}$

CAT 2020 Slot 2 - Questions 51-54

51. Let C be a circle of radius 5 meters having center at O. Let PQ be a chord of C that passes through points A and B where A is located 4 meters north of O and B is located 3 meters east of O. Then, the length of PQ, in meters, is nearest to

29 Nov 2020, Slot 2, Q55

- (A) 8.8 (B) 7.8
(C) 6.6 (D) 7.2

52. The sum of the perimeters of an equilateral triangle and a rectangle is 90cm. The area, T, of the triangle and the area, R, of the rectangle, both in sq cm, satisfying the relationship $R = T^2$. If the sides of the rectangle are in the ratio 1:3, then the length, in cm, of the longer side of the rectangle, is

29 Nov 2020, Slot 2, Q58

- (A) 27 (B) 21
(C) 24 (D) 18

53. Let C1 and C2 be concentric circles such that the diameter of C1 is 2cm longer than that of C2. If a chord of C1 has length 6cm and is a tangent to C2, then the diameter, in cm, of C1 is

29 Nov 2020, Slot 2, Q65

Type in the answer.

54. From an interior point of an equilateral triangle, perpendiculars are drawn on all three sides. The sum of the lengths of the three perpendiculars is s. Then the area of the triangle is

29 Nov 2020, Slot 2, Q69

- (A) $\frac{\sqrt{3}s^2}{2}$ (B) $\frac{2s^2}{\sqrt{3}}$
(C) $\frac{s^2}{2\sqrt{3}}$ (D) $\frac{s^2}{\sqrt{3}}$

CAT 2020 Slot 3 - Questions 55-58

55. The points (2,1) and (-3,-4) are opposite vertices of a parallelogram. If the other two vertices lie on the line $x + 9y + c = 0$, then c is

29 Nov 2020, Slot 3, Q65

- (A) 12 (B) 13
(C) 15 (D) 14

56. In a trapezium $ABCD$, AB is parallel to DC , BC is perpendicular to DC and $\angle BAD = 45^\circ$. If $DC = 5\text{ cm}$, $BC = 4\text{ cm}$, the area of the trapezium in sq cm is

29 Nov 2020, Slot 3, Q72

Type in the answer.

57. The area, in sq. units, enclosed by the lines $x = 2$, $y = |x - 2| + 4$, the X-axis and the Y-axis is equal to

29 Nov 2020, Slot 3, Q73

- (A) 10 (B) 6
(C) 8 (D) 12

58. The vertices of a triangle are (0,0), (4,0) and (3,9). The area of the circle passing through these three points is

29 Nov 2020, Slot 3, Q76

- (A) $\frac{14\pi}{3}$ (B) $\frac{123\pi}{7}$
(C) $\frac{12\pi}{5}$ (D) $\frac{205\pi}{9}$

CAT 2019 Slot 1 - Questions 59-64

59. AB is a diameter of a circle of radius 5 cm. Let P and Q be two points on the circle so that the length of PB is 6 cm, and the length of AP is twice that of AQ. Then the length, in cm, of QB is nearest to

24 Nov 2019, Slot 1, Q69

- (A) 9.3 (B) 7.8
(C) 9.1 (D) 8.5

60. In a circle of radius 11 cm, CD is a diameter and AB is a chord of length 20.5 cm. If AB and CD intersect at a point E inside the circle and CE has length 7 cm, then the difference of the lengths of BE and AE, in cm, is

24 Nov 2019, Slot 1, Q88

- (A) 2.5 (B) 1.5
(C) 3.5 (D) 0.5

61. Corners are cut off from an equilateral triangle T to produce a regular hexagon H. Then, the ratio of the area of H to the area of T is

24 Nov 2019, Slot 1, Q94

- (A) 2 : 3 (B) 4 : 5
(C) 5 : 6 (D) 3 : 4

62. Let S be the set of all points (x, y) in the x-y plane such that $|x| + |y| \leq 2$ and $|x| \geq 1$. Then, the area, in square units, of the region represented by S equals

24 Nov 2019, Slot 1, Q96

Type in the answer.

63. If the rectangular faces of a brick have their diagonals in the ratio $3 : 2\sqrt{3} : \sqrt{15}$, then the ratio of the length of the shortest edge of the brick to that of its longest edge is

24 Nov 2019, Slot 1, Q98

- (A) $\sqrt{3} : 2$ (B) $1 : \sqrt{3}$
(C) $2 : \sqrt{5}$ (D) $\sqrt{2} : \sqrt{3}$

64. Let T be the triangle formed by the straight line $3x + 5y - 45 = 0$ and the coordinate axes. Let the circumcircle of T have radius of length L, measured in the same unit as the coordinate axes. Then, the integer closest to L is

24 Nov 2019, Slot 1, Q100

Type in the answer.

CAT 2019 Slot 2 - Questions 65-71

65. Two circles, each of radius 4 cm, touch externally. Each of these two circles is touched externally by a third circle. If these three circles have a common tangent, then the radius of the third circle, in cm, is

24 Nov 2019, Slot 2, Q73

- (A) $\frac{1}{\sqrt{2}}$ (B) $\frac{\pi}{3}$
(C) $\sqrt{2}$ (D) 1

66. The base of a regular pyramid is a square and each of the other four sides is an equilateral triangle, length of each side being 20 cm. The vertical height of the pyramid, in cm, is

24 Nov 2019, Slot 2, Q76

- (A) 12 (B) $10\sqrt{2}$
(C) $8\sqrt{3}$ (D) $5\sqrt{5}$

67. Let ABC be a right-angled triangle with hypotenuse BC of length 20 cm. If AP is perpendicular on BC, then the maximum possible length of AP, in cm, is

24 Nov 2019, Slot 2, Q77

- (A) 10 (B) 5
(C) $8\sqrt{2}$ (D) $6\sqrt{2}$

68. A man makes complete use of 405 cc of iron, 783 cc of aluminium, and 351 cc of copper to make a number of solid right circular cylinders of each type of metal. These cylinders have the same volume and each of these has radius 3 cm. If the total number of cylinders is to be kept at a minimum, then the total surface area of all these cylinders, in sq cm, is

24 Nov 2019, Slot 2, Q82

- (A) $1026(1 + \pi)$ (B) 8464π
(C) 928π (D) $1044(4 + \pi)$

69. In a triangle ABC, medians AD and BE are perpendicular to each other, and have lengths 12 cm and 9 cm, respectively. Then, the area of triangle ABC, in sq cm, is

24 Nov 2019, Slot 2, Q91

- (A) 78 (B) 80
(C) 72 (D) 68

70. Let a, b, x, y be real numbers such that $a^2 + b^2 = 25$, $x^2 + y^2 = 169$, and $ax + by = 65$. If $k = ay - bx$, then

24 Nov 2019, Slot 2, Q93

- (A) $0 < k \leq \frac{5}{13}$ (B) $k > \frac{5}{13}$
(C) $k = \frac{5}{13}$ (D) $k = 0$

71. Let A and B be two regular polygons having a and b sides, respectively. If $b = 2a$ and each interior angle of B is $\frac{3}{2}$ times each interior angle of A, then each interior angle, in degrees, of a regular polygon with $a + b$ sides is

24 Nov 2019, Slot 2, Q97

Type in the answer.

CAT 2018 Slot 1 - Questions 72-77

72. In a circle, two parallel chords on the same side of a diameter have lengths 4 cm and 6 cm. If the distance between these chords is 1 cm, then the radius of the circle, in cm, is

25 Nov 2018, Slot 1, Q68

- (A) $\sqrt{13}$ (B) $\sqrt{14}$
(C) $\sqrt{11}$ (D) $\sqrt{12}$

73. Let ABCD be a rectangle inscribed in a circle of radius 13 cm. Which one of the following pairs can represent, in cm, the possible length and breadth of ABCD?

25 Nov 2018, Slot 1, Q70

- (A) 24, 10 (B) 25, 9
(C) 25, 10 (D) 24, 12

74. Points E, F, G, H lie on the sides AB, BC, CD, and DA, respectively, of a square ABCD. If EFGH is also a square whose area is 62.5% of that of ABCD and CG is longer than EB, then the ratio of length of EB to that of CG is

25 Nov 2018, Slot 1, Q71

- (A) 3 : 8 (B) 2 : 5
(C) 4 : 9 (D) 1 : 3

75. A right circular cone, of height 12 ft, stands on its base which has diameter 8 ft. The tip of the cone is cut off with a plane which is parallel to the base and 9 ft from the base. With $\pi = 22/7$, the volume, in cubic ft, of the remaining part of the cone is

25 Nov 2018, Slot 1, Q82

Type in the answer.

76. In a parallelogram ABCD of area 72 sq cm, the sides CD and AD have lengths 9 cm and 16 cm, respectively. Let P be a point on CD such that AP is perpendicular to CD. Then the area, in sq cm, of triangle APD is

25 Nov 2018, Slot 1, Q90

- (A) $32\sqrt{3}$ (B) $18\sqrt{3}$
(C) $24\sqrt{3}$ (D) $12\sqrt{3}$

77. In a circle with center O and radius 1 cm, an arc AB makes an angle 60 degrees at O. Let R be the region bounded by the radii OA, OB and the arc AB. If C and D are two points on OA and OB, respectively, such that OC = OD and the area of triangle OCD is half that of R, then the length of OC, in cm, is

25 Nov 2018, Slot 1, Q92

- (A) $\left(\frac{\pi}{4\sqrt{3}}\right)^{\frac{1}{2}}$ (B) $\left(\frac{\pi}{6}\right)^{\frac{1}{2}}$
(C) $\left(\frac{\pi}{3\sqrt{3}}\right)^{\frac{1}{2}}$ (D) $\left(\frac{\pi}{4}\right)^{\frac{1}{2}}$

CAT 2018 Slot 2 - Questions 78-83

78. A parallelogram ABCD has area 48 sqcm. If the length of CD is 8 cm and that of AD is s cm, then which one of the following is necessarily true?

25 Nov 2018, Slot 2, Q74

- (A) $s \neq 6$ (B) $s \geq 6$
(C) $5 \leq s \leq 7$ (D) $s \leq 6$

79. A chord of length 5 cm subtends an angle of 60° at the centre of a circle. The length, in cm, of a chord that subtends an angle of 120° at the centre of the same circle is

25 Nov 2018, Slot 2, Q77

- (A) $5\sqrt{3}$ (B) 2π
(C) 8 (D) $6\sqrt{2}$

80. The area of a rectangle and the square of its perimeter are in the ratio 1 : 25. Then the lengths of the shorter and longer sides of the rectangle are in the ratio

25 Nov 2018, Slot 2, Q85

- (A) 1:4 (B) 2:9
(C) 1:3 (D) 3:8

81. On a triangle ABC, a circle with diameter BC is drawn, intersecting AB and AC at points P and Q, respectively. If the lengths of AB, AC, and CP are 30 cm, 25 cm, and 20 cm respectively, then the length of BQ, in cm, is

25 Nov 2018, Slot 2, Q86

Type in the answer.

82. A triangle ABC has area 32 sq units and its side BC, of length 8 units, lies on the line $x = 4$. Then the shortest possible distance between A and the point (0,0) is

25 Nov 2018, Slot 2, Q87

- (A) 8 units (B) 4 units
(C) $2\sqrt{2}$ units (D) $4\sqrt{2}$ units

83. From a rectangle ABCD of area 768 sq cm, a semicircular part with diameter AB and area 72π sq cm is removed. The perimeter of the leftover portion, in cm, is

25 Nov 2018, Slot 2, Q88

- (A) $80 + 16\pi$ (B) $86 + 8\pi$
(C) $88 + 12\pi$ (D) $82 + 24\pi$

90. The shortest distance of the point $(\frac{1}{2}, 1)$ from the curve $y = |x - 1| + |x + 1|$ is

26 Nov 2017, Slot 1, Q96

(A) 1

(B) 0

(C) $\sqrt{2}$

(D) $\sqrt{\frac{3}{2}}$

CAT 2017 Slot 2 - Questions 91-96

91. Let ABCDEF be a regular hexagon with each side of length 1 cm. The area (in sq cm) of a square with AC as one side is

26 Nov 2017, Slot 2, Q81

- (A) $3\sqrt{2}$ (B) 3
(C) 4 (D) $\sqrt{3}$

92. The base of a vertical pillar with uniform cross section is a trapezium whose parallel sides are of lengths 10 cm and 20 cm while the other two sides are of equal length. The perpendicular distance between the parallel sides of the trapezium is 12 cm. If the height of the pillar is 20 cm, then the total area, in sq cm, of all six surfaces of the pillar is

26 Nov 2017, Slot 2, Q82

- (A) 1300 (B) 1340
(C) 1480 (D) 1520

93. The points (2, 5) and (6, 3) are two end points of a diagonal of a rectangle. If the other diagonal has the equation $y = 3x + c$, then c is

26 Nov 2017, Slot 2, Q83

- (A) -5 (B) -6
(C) -7 (D) -8

94. ABCD is a quadrilateral inscribed in a circle with centre O such that O lies inside the quadrilateral. If $\angle COD = 120$ degrees and $\angle BAC = 30$ degrees, then the value of $\angle BCD$ (in degrees) is

26 Nov 2017, Slot 2, Q84

Type in the answer.

95. If three sides of a rectangular park have a total length 400 ft, then the area of the park is maximum when the length (in ft) of its longer side is

26 Nov 2017, Slot 2, Q85

Type in the answer.

96. Let P be an interior point of a right-angled isosceles triangle ABC with hypotenuse AB. If the perpendicular distance of P from each of AB, BC, and CA is $4(\sqrt{2} - 1)$ cm, then the area, in sq cm, of the triangle ABC is

26 Nov 2017, Slot 2, Q86

Type in the answer.

CAT 2008 - Questions 97-102

97. In a triangle ABC, the lengths of the sides AB and AC equal 17.5 cm and 9 cm respectively. Let D be a point on the line segment BC such that AD is perpendicular to BC. If $AD = 3$ cm, then what is the radius (in cm) of the circle circumscribing the triangle ABC?

16 Nov 2008, Q13

- (A) 17.05 (B) 27.85
(C) 22.45 (D) 32.25
(E) 26.25

98. Consider obtuse-angled triangles with sides 8 cm, 15 cm and x cm. If x is an integer then how many such triangles exist?

16 Nov 2008, Q14

- (A) 5 (B) 21
(C) 10 (D) 15
(E) 14

99. Consider a square ABCD with midpoints E, F, G, H of AB, BC, CD and DA respectively. Let L denote the line passing through F and H. Consider points P and Q, on L and inside ABCD such that the angles APD and BQC both equal 120° . What is the ratio of the area of ABQCDP to the remaining area inside ABCD?

16 Nov 2008, Q15

- (A) $\frac{4\sqrt{2}}{3}$ (B) $2 + \sqrt{3}$
(C) $\frac{10 - 3\sqrt{3}}{9}$ (D) $1 + \frac{1}{\sqrt{3}}$
(E) $2\sqrt{3} - 1$

100. Two circles, both of radii 1 cm, intersect such that the circumference of each one passes through the centre of the other. What is the area (in sq. cm.) of the intersecting region?

16 Nov 2008, Q21

- (A) $\frac{\pi}{3} - \frac{\sqrt{3}}{4}$ (B) $\frac{2\pi}{3} + \frac{\sqrt{3}}{2}$
(C) $\frac{4\pi}{3} - \frac{\sqrt{3}}{2}$ (D) $\frac{4\pi}{3} + \frac{\sqrt{3}}{2}$
(E) $\frac{2\pi}{3} - \frac{\sqrt{3}}{2}$

101. Rahim plans to drive from city A to station C, at the speed of 70 km per hour, to catch a train arriving there from B. He must reach C at least 15 minutes before the arrival of the train. The train leaves B, located 500 km south of A, at 8:00 am and travels at a speed of 50 km per hour. It is known that C is located between west and northwest of B, with BC at 60° to AB. Also, C is located between south and southwest of A with AC at 30° to AB. The latest time by which Rahim must leave A and still catch the train is closest to

- (A) 6 : 15 am
(B) 6 : 30 am
(C) 6 : 45 am
(D) 7 : 00 am
(E) 7 : 15 am
-

102. Consider a right circular cone of base radius 4 cm and height 10 cm. A cylinder is to be placed inside the cone with one of the flat surfaces resting on the base of the cone. Find the largest possible total surface area (in sq. cm) of the cylinder.

- (A) $\frac{100\pi}{3}$
(B) $\frac{80\pi}{3}$
(C) $\frac{120\pi}{7}$
(D) $\frac{130\pi}{9}$
(E) $\frac{110\pi}{7}$
-

103. Two circles with centres P and Q cut each other at two distinct points A and B. The circles have the same radii and neither P nor Q falls within the intersection of the circles. What is the smallest range that includes all possible values of the angle AQP in degrees?

18 Nov 2007, Q22

- | | |
|----------------------|----------------------|
| (A) Between 0 and 90 | (B) Between 0 and 30 |
| (C) Between 0 and 60 | (D) Between 0 and 75 |
| (E) Between 0 and 45 | |
-

CAT 2006 - Questions 104-108

104. The length, breadth and height of a room are in the ratio 3:2:1. If the breadth and height are halved while the length is doubled, then the total area of the four walls of the room will

19 Nov 2006, Q55

- (A) remain the same
- (B) decrease by 13.64%
- (C) decrease by 15%
- (D) decrease by 18.75%
- (E) decrease by 30%

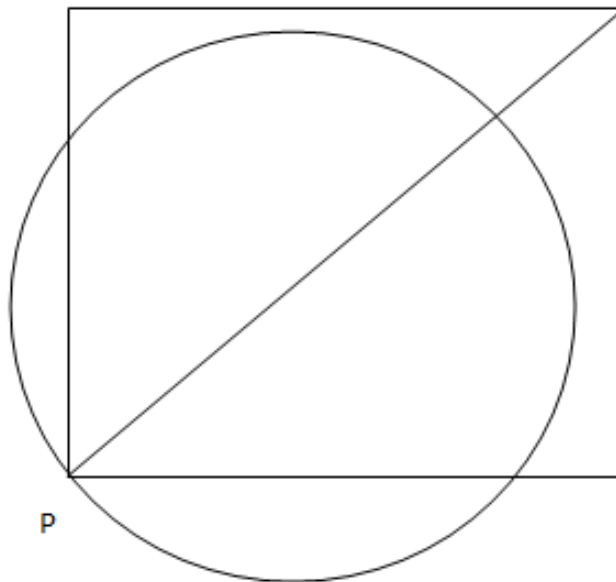
105. A semi-circle is drawn with AB as its diameter. From C, a point on AB, a line perpendicular to AB is drawn meeting the circumference of the semi-circle at D. Given that $AC = 2$ cm and $CD = 6$ cm, the area of the semi-circle (in sq. cm) will be:

19 Nov 2006, Q57

- (A) 32π
- (B) 50π
- (C) 40.5π
- (D) 81π
- (E) Can't be determined

Questions 106 to 107

A punching machine is used to punch a circular hole of diameter two Units from a square sheet of aluminium of width 2 units, as shown below. The hole is punched such that the circular hole touches one corner P of the square sheet and the diameter of the hole originating at P is in line with a diagonal of the square:



106. The proportion of the sheet area that remains after punching is:

19 Nov 2006, Q61

- (A) $(\pi + 2)/8$ (B) $(6 - \pi)/8$
(C) $(4 - \pi)/4$ (D) $(\pi - 2)/4$
(E) $(14 - 3\pi)/6$
-

107. Find the area of the part of the circle (round punch) falling outside the square sheet.

19 Nov 2006, Q62

- (A) $\pi/4$ (B) $(\pi - 1)/2$
(C) $(\pi - 1)/4$ (D) $(\pi - 2)/2$
(E) $(\pi - 2)/4$
-

108. An equilateral triangle DOC is drawn inside a square ABCD. What is the value of the angle AOB in degrees?

19 Nov 2006, Q74

- (A) 75 (B) 90
(C) 120 (D) 135
(E) 150
-

CAT 2005 - Questions 109-119

109. Two identical circles intersect so that their centres, and the points at which they intersect, form a square of side 1 cm. The area in sq. cm of the portion that is common to the two circles is

20 Nov 2005, Q3

- | | |
|-------------|----------------------|
| (A) $\pi/4$ | (B) $\pi/2 - 1$ |
| (C) $\pi/5$ | (D) $\sqrt{\pi} - 1$ |

110. A jogging park has two identical circular tracks touching each other, and a rectangular track enclosing the two circles. The edges of the rectangles are tangential to the circles. Two friends, A and B, start jogging simultaneously from the point where one of the circular tracks touches the smaller side of the rectangular track. A jogs along the rectangular track, while B jogs along the two circular tracks in a figure of eight. Approximately, how much faster than A does B have to run, so that they take the same time to return to their starting point?

20 Nov 2005, Q4

- | | |
|-----------|-----------|
| (A) 3.88% | (B) 4.22% |
| (C) 4.34% | (D) 4.46% |

111. What is the distance in cm between two parallel chords of lengths 32 cm and 24 cm in a circle of radius 20 cm?

20 Nov 2005, Q9

- | | |
|-------------|-------------|
| (A) 1 or 7 | (B) 2 or 14 |
| (C) 3 or 21 | (D) 4 or 28 |

112. For which value of k does the following pair of equations yield a unique solution for x such that the solution is positive? $x^2 - y^2 = 0$ $(x - k)^2 + y^2 = 1$

20 Nov 2005, Q10

- | | |
|----------------|------------------|
| (A) 2 | (B) 0 |
| (C) $\sqrt{2}$ | (D) $-2\sqrt{2}$ |

113. Consider a triangle drawn on the X-Y plane with its three vertices at (41, 0), (0, 41) and (0, 0), each vertex being represented by its (X,Y) coordinates. The number of points with integer coordinates inside the triangle (excluding all the points on the boundary) is

20 Nov 2005, Q12

- | | |
|---------|---------|
| (A) 780 | (B) 800 |
| (C) 820 | (D) 741 |

114. Four points A, B, C, and D lie on a straight line in the X-Y plane, such that $AB = BC = CD$, and the length of AB is 1 metre. An ant at A wants to reach a sugar particle at D. But there are insect repellents kept at points B and C. The ant would not go within one metre of any insect repellent. The minimum distance in metres the

ant must traverse to reach the sugar particle is

20 Nov 2005, Q17

- (A) $3\sqrt{2}$ (B) $1+\pi$
(C) $4\pi/3$ (D) 5

115. Rectangular tiles each of size 70 cm by 30 cm must be laid horizontally on a rectangular floor of size 110 cm by 130 cm, such that the tiles do not overlap. A tile can be placed in any orientation so long as its edges are parallel to the edges of the floor. No tile should overshoot any edge of the floor. The maximum number of tiles that can be accommodated on the floor is

20 Nov 2005, Q20

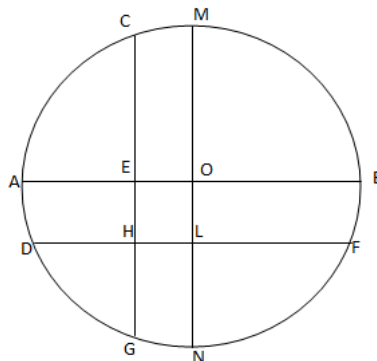
- (A) 4 (B) 5
(C) 6 (D) 7

116. In the X-Y plane, the area of the region bounded by the graph of $|x+y| + |x-y| = 4$ is

20 Nov 2005, Q21

- (A) 8 (B) 12
(C) 16 (D) 20

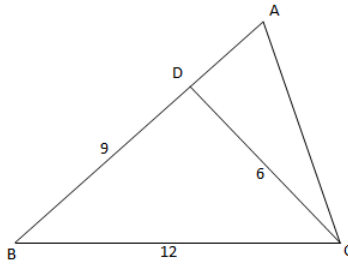
117. In the following figure, the diameter of the circle is 3 cm. AB and MN are two diameters such that MN is perpendicular to AB. In addition, CG is perpendicular to AB such that AE:EB = 1:2, and DF is perpendicular to MN such that NL:LM = 1:2. The length of DH in cm is



20 Nov 2005, Q22

- (A) $2\sqrt{2} - 1$ (B) $(2\sqrt{2} - 1)/2$
(C) $(3\sqrt{2} - 1)/2$ (D) $(2\sqrt{2} - 1)/3$

118. Consider the triangle ABC shown in the following figure where BC = 12 cm, DB = 9 cm, CD = 6 and $\angle BCD = \angle BAC$ What is the ratio of the perimeter of the triangle ADC to that of the triangle BDC?



20 Nov 2005, Q23

- (A) $7/9$ (B) $8/9$
 (C) $6/9$ (D) $5/9$

119. P, Q, S, and R are points on the circumference of a circle of radius r , such that PQR is an equilateral triangle and PS is a diameter of the circle. What is the perimeter of the quadrilateral PQSR?

20 Nov 2005, Q24

- (A) $2r(1 + \sqrt{3})$ (B) $2r(2 + \sqrt{3})$
 (C) $r(1 + \sqrt{5})$ (D) $2r + \sqrt{3}$

CAT 2004 - Questions 120-129

120. A rectangular sheet of paper, when halved by folding it at the mid point of its longer side, results in a rectangle, whose longer and shorter sides are in the same proportion as the longer and shorter sides of the original rectangle. If the shorter side of the original rectangle is 2, what is the area of the smaller rectangle? [CAT 2004]

21 Nov 2004, Q40

- (A) $4\sqrt{2}$ (B) $2\sqrt{2}$
(C) $\sqrt{2}$ (D) None of the above

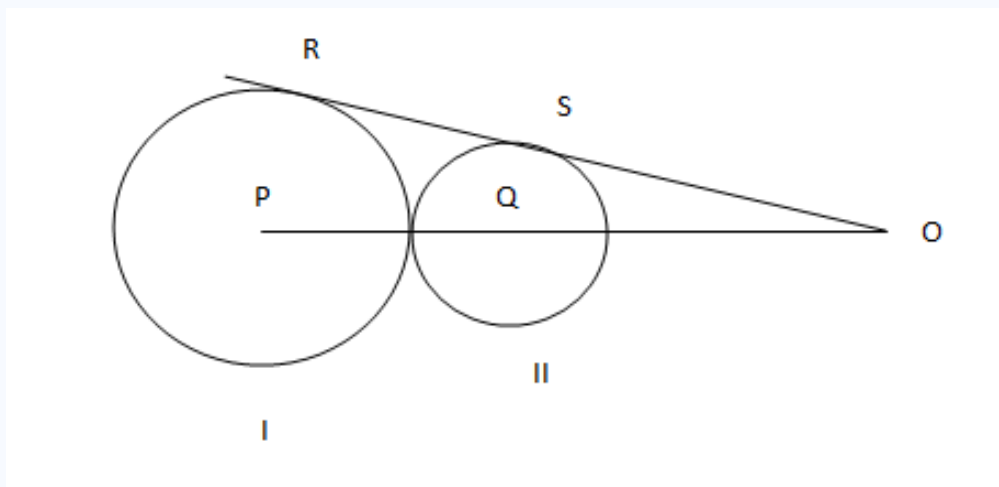
121. A father and his son are waiting at a bus stop in the evening. There is a lamp post behind them. The lamp post, the father and his son stand on the same straight line. The father observes that the shadows of his head and his son's head are incident at the same point on the ground. If the heights of the lamp post, the father and his son are 6 metres, 1.8 metres and 0.9 metres respectively, and the father is standing 2.1 metres away from the post then how far (in metres) is son standing from his father?

21 Nov 2004, Q52

- (A) 0.9 (B) 0.75
(C) 0.6 (D) 0.45

Questions 122 to 124

Directions for the following three questions: Answer the questions on the basis of the information given below



In the adjoining figure I and II are circles with centres P and Q respectively, The two circles touch each other and have common tangent that touches them at points R and S respectively. This common tangent meets the line joining P and Q at O. The diameters of I and II are in the ratio 4: 3. It is also known that the length of PO is 28 cm.

122. What is the ratio of the length of PQ to that of QO? [CAT 2004]

21 Nov 2004, Q53

- (A) 1 : 4 (B) 1 : 3
(C) 3 : 8 (D) 3 : 4

123. What is the radius of the circle II? [CAT 2004]

21 Nov 2004, Q54

- (A) 2 cm (B) 3 cm
(C) 4 cm (D) 5 cm

124. The length of SO is [CAT 2004]

21 Nov 2004, Q55

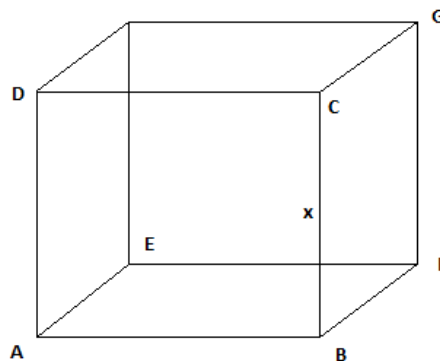
- (A) $8\sqrt{3}$ cm (B) $10\sqrt{3}$ cm
(C) $12\sqrt{3}$ cm (D) $14\sqrt{3}$ cm

125. Let C be a circle with centre P_0 and AB be a diameter of C . Suppose P_1 is the mid point of the line segment P_0B , P_2 is the mid point of the line segment P_1B and so on. Let $C_1, C_2, C_3, \dots$ be circles with diameters $P_0P_1, P_1P_2, P_2P_3, \dots$ respectively. Suppose the circles $C_1, C_2, C_3, \dots$ are all shaded. The ratio of the area of the unshaded portion of C to that of the original circle is

21 Nov 2004, Q59

- (A) 8 : 9 (B) 9 : 10
(C) 10 : 11 (D) 11 : 12

126. If the lengths of diagonals DE , AG and CE of the cube shown in the adjoining figure are equal to the three sides of a triangle, then the radius of the circle circumscribing that triangle will be?



21 Nov 2004, Q65

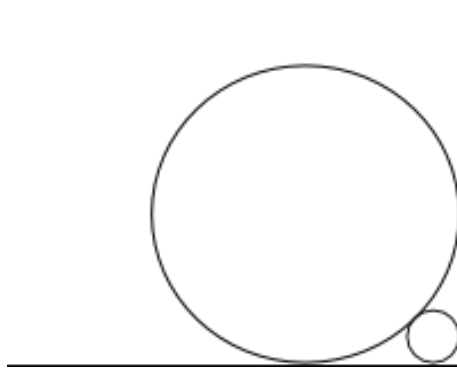
- (A) equal to the side of the cube (B) $\sqrt{3}$ times the side of the cube
(C) $1/\sqrt{3}$ times the side of the cube (D) impossible to find from the given information

127. On a semicircle with diameter AD , chord BC is parallel to the diameter. Further; AD and BC are separated by 2cm, while AD has length 8. What is the length of BC ?

21 Nov 2004, Q67

- (A) $2\sqrt{3}$ (B) $4\sqrt{3}$
(C) 8.6 (D) None of the above

128. A circle with radius 2 is placed against a right angle. Another smaller circle is also placed as shown in the adjoining figure. What is the radius of the smaller circle?

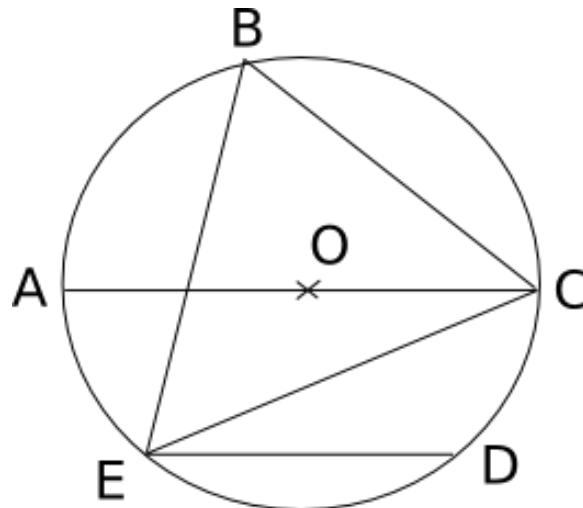


21 Nov 2004, Q68

- (A) $3 - 2\sqrt{2}$
(C) $7 - 4\sqrt{2}$

- (B) $4 - 2\sqrt{2}$
(D) $6 - 4\sqrt{2}$

129.



In the adjoining figure, chord ED is parallel to the diameter AC of the circle. If angle CBE = 65° , then what is the value of angle DEC?

21 Nov 2004, Q69

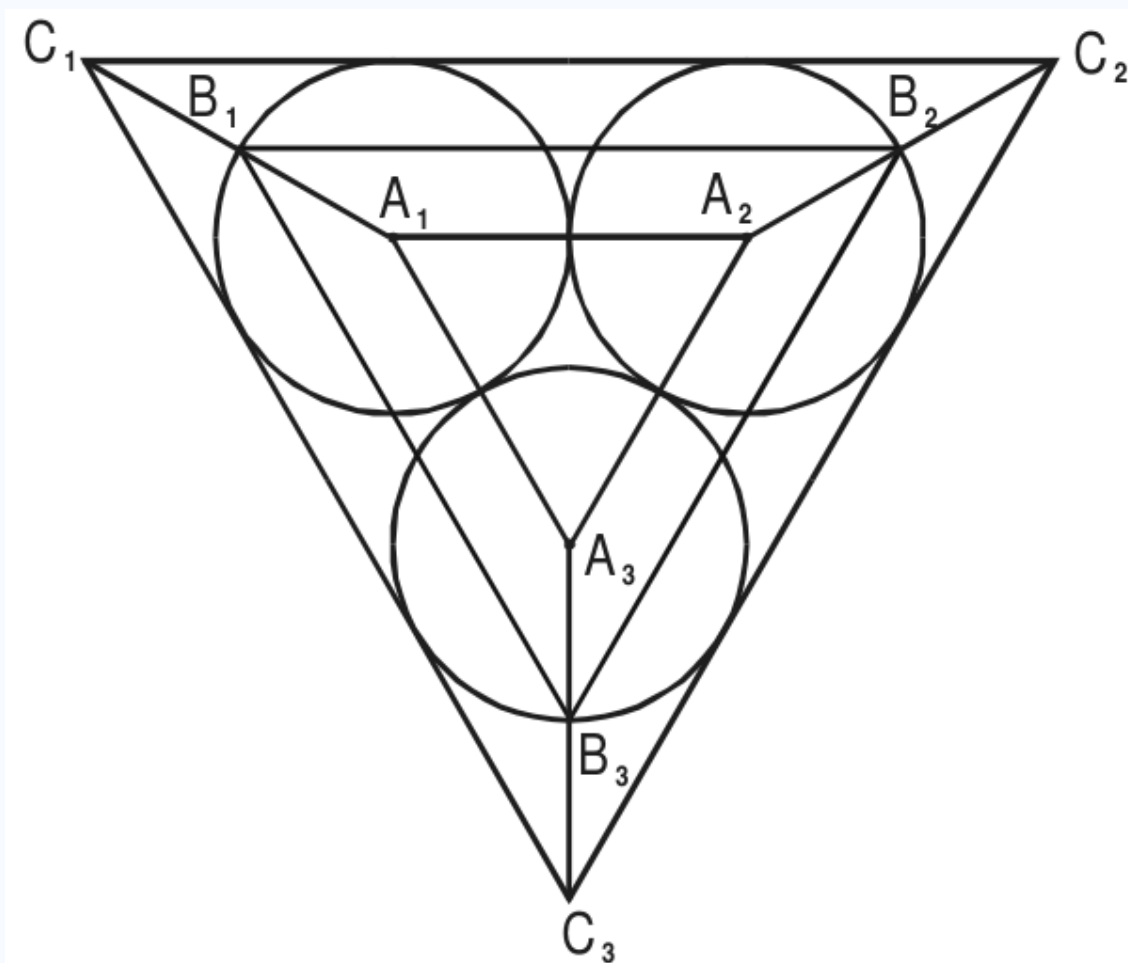
- (A) 35
(C) 45

- (B) 55
(D) 25

Questions 130 to 130

Directions for Questions 130 to 130: Answer the questions on the basis of the information given below.

Consider three circular parks of equal size with centres at A_1 , A_2 , and A_3 respectively. The parks touch each other at the edge as shown in the figure (not drawn to scale). There are three paths formed by the triangles $A_1A_2A_3$, $B_1B_2B_3$, and $C_1C_2C_3$, as shown. Three sprinters A, B and C begin running from points A_1 , B_1 and C_1 respectively. Each sprinter traverses her respective triangular path clockwise and returns to her starting point.



130. Let the radius of each circular park be r , and the distances to be traversed by the sprinters A, B and C be a , b and c respectively. Which of the following is true?

15 Feb 2004, CAT 2003 Re-test, Q54

(A) $b - a = c - b = 3\sqrt{3}r$

(B) $b - a = c - b = \sqrt{3}r$

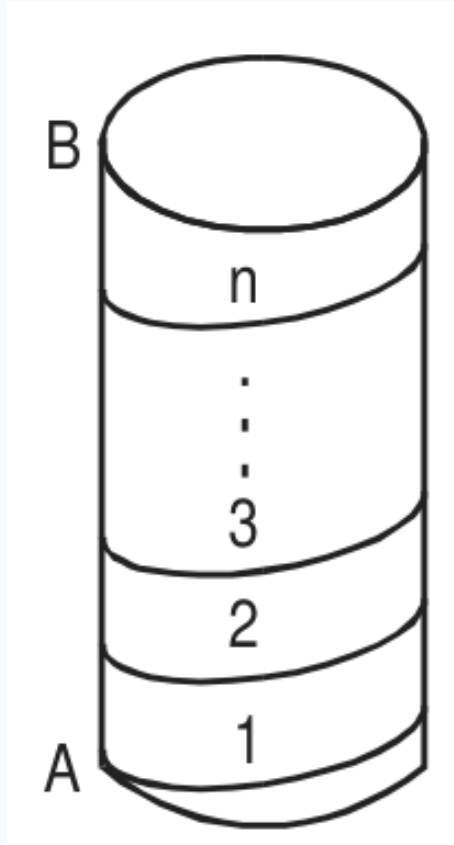
(C) $b = \frac{a+c}{2} = 2(1 + \sqrt{3})r$

(D) $c = 2b - a = (2 + \sqrt{3})r$

Questions 131 to 133

Directions for Questions 131 to 133: Answer the questions on the basis of the information given below.

Consider a cylinder of height h cm and radius $r = \frac{2}{\pi}$ cm as shown in the figure (not drawn to scale). A string of a certain length, when wound on its cylindrical surface, starting at point A and ending at point B, gives a maximum of n turns (in other words, the string's length is the minimum length required to wind n turns).



131. What is the vertical spacing between the two consecutive turns?

15 Feb 2004, CAT 2003 Re-test, Q57

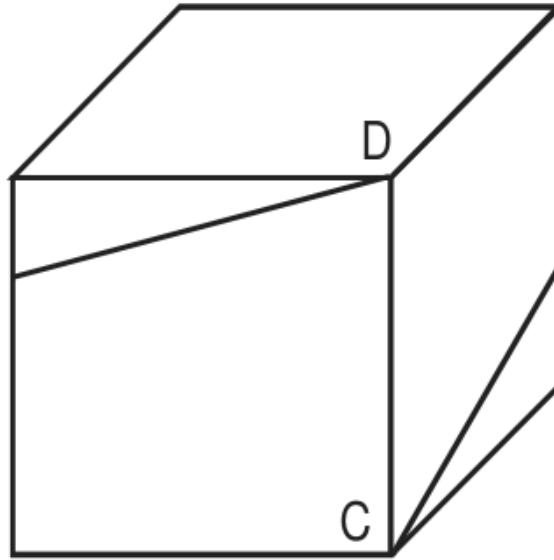
(A) $\frac{h}{n}$ cm

(B) $\frac{h}{\sqrt{n}}$ cm

(C) $\frac{h}{n^2}$ cm

(D) Cannot be determined

132. The same string, when wound on the exterior four walls of a cube of side n cm, starting at point C and ending at point D, can give exactly one turn (see figure, not drawn to scale). The length of the string is



15 Feb 2004, CAT 2003 Re-test, Q58

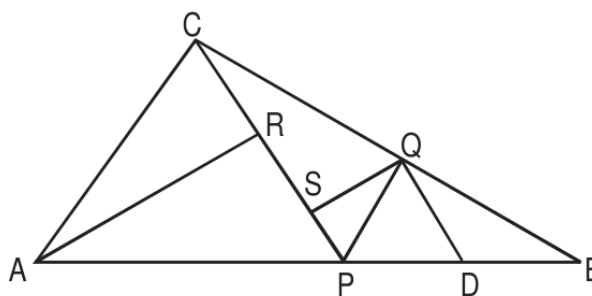
- (A) $\sqrt{2}n$ cm (B) $\sqrt{17}n$ cm
(C) n cm (D) $\sqrt{13}n$ cm

133. In the set-up of the previous two questions, how is h related to n ?

15 Feb 2004, CAT 2003 Re-test, Q59

- (A) $h = \sqrt{2}n$ (B) $h = \sqrt{17}n$
(C) $h = n$ (D) $h = \sqrt{13}n$

134. In the figure (not drawn to scale) given below, P is a point on AB such that $AP : PB = 4 : 3$. PQ is parallel to AC and QD is parallel to CP . In $\triangle ARC$, $\angle ARC = 90^\circ$, and in $\triangle PQS$, $\angle PSQ = 90^\circ$. The length of QS is 6 cm. What is the ratio $AP : PD$?



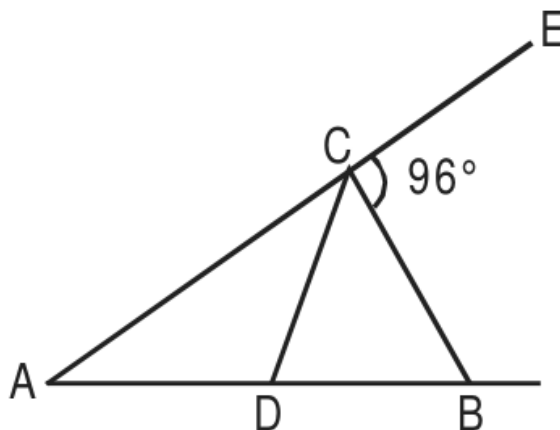
15 Feb 2004, CAT 2003 Re-test, Q61

- (A) 10 : 3 (B) 2 : 1
(C) 7 : 3 (D) 8 : 3

135. A car is being driven, in a straight line and at a uniform speed, towards the base of a vertical tower. The top of the tower is observed from the car and, in the process, it takes 10 min for the angle of elevation to change from 45° to 60° . After how much more time will this car reach the base of the tower?

- (A) $5(\sqrt{3} + 1)$ (B) $6(\sqrt{3} + \sqrt{2})$
 (C) $7(\sqrt{3} - 1)$ (D) $8(\sqrt{3} - 2)$

136. In the figure (not drawn to scale) given below, if $AD = CD = BC$ and $\angle BCE = 96^\circ$, how much is the value of $\angle DBC$?



15 Feb 2004, CAT 2003 Re-test, Q63

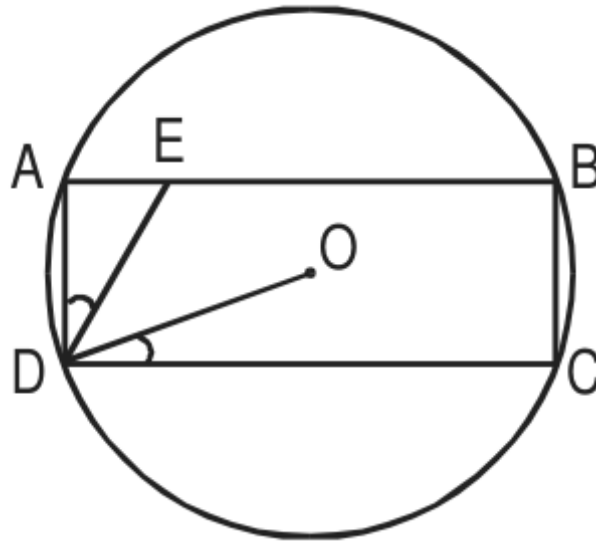
- (A) 32° (B) 84°
 (C) 64° (D) Cannot be determined

137. Consider two different cloth-cutting processes. In the first one, n circular cloth pieces are cut from a square cloth piece of side a in the following steps: the original square of side a is divided into n smaller squares, not necessarily of the same size, then a circle of maximum possible area is cut from each of the smaller squares. In the second process, only one circle of maximum possible area is cut from the square of side a and the process ends there. The cloth pieces remaining after cutting the circles are scrapped in both the processes. The ratio of the total area of scrap cloth generated in the former to that in the latter is

15 Feb 2004, CAT 2003 Re-test, Q68

- (A) $1 : 1$ (B) $\sqrt{2} : 1$
 (C) $\frac{n(4 - \pi)}{4n - \pi}$ (D) $\frac{4n - \pi}{n(4 - \pi)}$

138. In the figure below (not drawn to scale), rectangle ABCD is inscribed in the circle with centre at O. The length of side AB is greater than side BC. The ratio of the area of the circle to the area of the rectangle ABCD is $\pi : \sqrt{3}$. The line segment DE intersects AB at E such that $\angle ODC = \angle ADE$. The ratio AE : AD is



15 Feb 2004, CAT 2003 Re-test, Q69

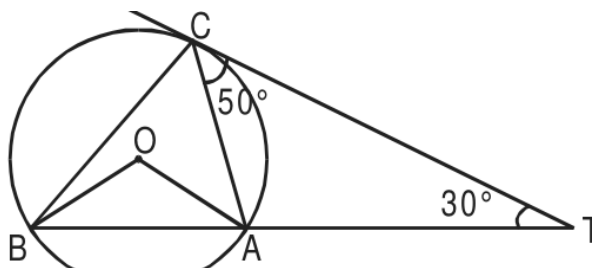
- (A) $1 : \sqrt{3}$ (B) $1 : \sqrt{2}$
 (C) $1 : 2\sqrt{3}$ (D) $1 : 2$

139. The length of the circumference of a circle equals the perimeter of a triangle of equal sides, and also the perimeter of a square. The areas covered by the circle, triangle, and square are c , t and s , respectively. Then,

15 Feb 2004, CAT 2003 Re-test, Q72

- (A) $s > t > c$ (B) $c > t > s$
 (C) $c > s > t$ (D) $s > c > t$

140. In the figure given below (not drawn to scale), A, B and C are three points on a circle with centre O. The chord BA is extended to a point T such that CT becomes a tangent to the circle at point C. If $\angle ATC = 30^\circ$ and $\angle ACT = 50^\circ$, then the angle $\angle BOA$ is



15 Feb 2004, CAT 2003 Re-test, Q78

- (A) 100° (B) 150°
 (C) 80° (D) not possible to determine

141. Let ABCDEF be a regular hexagon. What is the ratio of the area of the $\triangle ACE$ to that of the hexagon ABCDEF?

(A) $\frac{1}{3}$
(C) $\frac{2}{3}$

(B) $\frac{1}{2}$
(D) $\frac{5}{6}$

142. A piece of paper is in the shape of a right-angled triangle and is cut along a line that is parallel to the hypotenuse, leaving a smaller triangle. There was 35% reduction in the length of the hypotenuse of the triangle. If the area of the original triangle was 34 square inches before the cut, what is the area (in square inches) of the smaller triangle?

15 Feb 2004, CAT 2003 Re-test, Q88

(A) 16.665
(C) 15.465

(B) 16.565
(D) 14.365

143. Two straight roads R1 and R2 diverge from a point A at an angle of 120° . Ram starts walking from point A along R1 at a uniform speed of 3 km/hr. Shyam starts walking at the same time from A along R2 at a uniform speed of 2 km/hr. They continue walking for 4 hr along their respective roads and reach points B and C on R1 and R2 respectively. There is a straight line path connecting B and C. Then Ram returns to point A after walking along line segments BC and CA. Shyam also returns to A after walking along line segments BC and CA. Their speeds remain unchanged. The time interval (in hours) between Ram's and Shyam's return to the point A is

15 Feb 2004, CAT 2003 Re-test, Q89

(A) $\frac{10\sqrt{19} + 26}{3}$
(C) $\frac{\sqrt{19} + 26}{3}$

(B) $\frac{2\sqrt{19} + 10}{3}$
(D) $\frac{\sqrt{19} + 10}{3}$

144. A square tin sheet of side 12 inches is converted into a box with open top in the following steps. The sheet is placed horizontally. Then, equal-sized squares, each of side x inches, are cut from the four corners of the sheet. Finally, the four resulting sides are bent vertically upwards in the shape of a box. If x is an integer, then what value of x maximizes the volume of the box?

15 Feb 2004, CAT 2003 Re-test, Q90

(A) 3
(C) 1

(B) 4
(D) 2

145. Let A and B be two solid spheres such that the surface area of B is 300% higher than the surface area of A. The volume of A is found to be k% lower than the volume of B. The value of k must be

23 Nov 2003, CAT 2003 Original sitting, Q107

- (A) 85.5 (B) 92.5
(C) 90.5 (D) 87.5

Questions 146 to 146

DIRECTIONS for the following three questions: Answer the questions on the basis of the information given below.

A city has two perfectly circular and concentric ring roads, the outer ring road (OR) being twice as long as the inner ring road (IR). There are also four (straight line) chord roads from E1, the east end point of OR to N2, the north end point of IR; from N1, the north end point of OR to W2, the west end point of IR; from W1, the west end point of OR, to S2, the south end point of IR; and from S1 the south end point of OR to E2, the east end point of IR. Traffic moves at a constant speed of 30π km/hr on the OR road, 20π km/hr on the IR road, and $15\sqrt{5}$ km/hr on all the chord roads.

146. The ratio of the sum of the lengths of all chord roads to the length of the outer ring road is

23 Nov 2003, CAT 2003 Original sitting, Q111

- (A) $\sqrt{5} : 2$ (B) $\sqrt{5} : 2\pi$
(C) $\sqrt{5} : \pi$ (D) None of the above.

147. Each side of a given polygon is parallel to either the X or the Y axis. A corner of such a polygon is said to be convex if the internal angle is 90° or concave if the internal angle is 270° . If the number of convex corners in such a polygon is 25, the number of concave corners must be

23 Nov 2003, CAT 2003 Original sitting, Q127

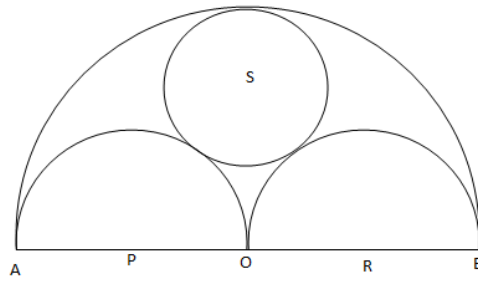
- (A) 20 (B) 0
(C) 21 (D) 22

148. There are two concentric circles such that the area of the outer circle is four times the area of the inner circle. Let A, B and C be three distinct points on the perimeter of the outer circle such that AB and AC are tangents to the inner circle. If the area of the outer circle is 12 square centimeters then the area (in square centimeters) of the triangle ABC would be

23 Nov 2003, CAT 2003 Original sitting, Q130

- (A) $\pi\sqrt{12}$ (B) $9/\pi$
(C) $9\sqrt{3}/\pi$ (D) $6\sqrt{3}/\pi$

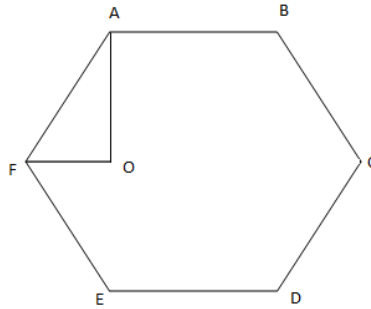
149. Three horses are grazing within a semi-circular field. In the diagram given below, AB is the diameter of the semi-circular field with center at O. Horses are tied up at P, R and S such that PO and RO are the radii of semi-circles with centers at P and R respectively, and S is the center of the circle touching the two semi-circles with diameters AO and OB. The horses tied at P and R can graze within the respective semi-circles and the horse tied at S can graze within the circle centred at S. The percentage of the area of the semi-circle with diameter AB that cannot be grazed by the horses is nearest to



23 Nov 2003, CAT 2003 Original sitting, Q132

- (A) 20 (B) 28
(C) 36 (D) 40

150. In the figure below, ABCDEF is a regular hexagon and $\angle AOF = 90^\circ$. FO is parallel to ED. What is the ratio of the area of the triangle AOF to that of the hexagon ABCDEF?



23 Nov 2003, CAT 2003 Original sitting, Q133

- (A) $1/12$ (B) $1/6$
(C) $1/24$ (D) $1/18$

151. A vertical tower OP stands at the center O of a square ABCD. Let h and b denote the length OP and AB respectively. Suppose $\angle APB = 60^\circ$ then the relationship between h and b can be expressed as

23 Nov 2003, CAT 2003 Original sitting, Q135

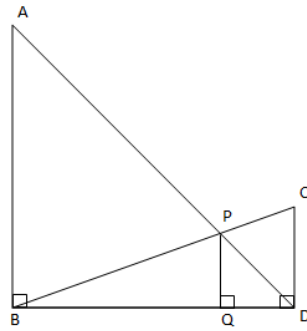
- (A) $2b^2 = h^2$ (B) $2h^2 = b^2$
(C) $3b^2 = 2h^2$ (D) $3h^2 = 2b^2$

152. In the triangle ABC, $AB = 6$, $BC = 8$ and $AC = 10$. A perpendicular dropped from B, meets the side AC at D. A circle of radius BD (with center B) is drawn. If the circle cuts AB and BC at P and Q respectively, the AP:QC is equal to

23 Nov 2003, CAT 2003 Original sitting, Q136

- (A) 1:1 (B) 3:2
(C) 4:1 (D) 3:8

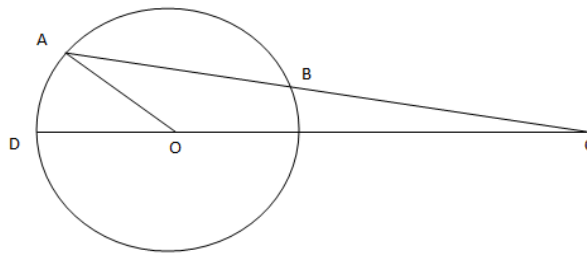
153. In the diagram given below, $\angle ABD = \angle CDB = \angle PQD = 90^\circ$. If $AB:CD = 3:1$, the ratio of $CD:PQ$ is



23 Nov 2003, CAT 2003 Original sitting, Q137

- (A) 1 : 0.69
(B) 1 : 0.75
(C) 1 : 0.72
(D) None of the above.

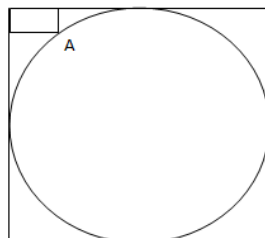
154. In the figure below, AB is the chord of a circle with center O . AB is extended to C such that $BC = OB$. The straight line CO is produced to meet the circle at D . If $\angle ACD = y$ degrees and $\angle AOD = x$ degrees such that $x = ky$, then the value of k is



23 Nov 2003, CAT 2003 Original sitting, Q141

- (A) 3
(B) 2
(C) 1
(D) None of the above.

155. In the figure below, the rectangle at the corner measures $10 \text{ cm} \times 20 \text{ cm}$. The corner A of the rectangle is also a point on the circumference of the circle. What is the radius of the circle in cm ?



(A) 10 cm
(C) 50 cm

(B) 40 cm
(D) None of the above.

CAT 2002 - Questions 156-165

156. In triangle ABC, the internal bisector of $\angle A$ meets BC at D. If $AB = 4$, $AC = 3$ and $\angle A = 60^\circ$, then the length of AD is

CAT 2002, Q52

- (A) $2\sqrt{3}$ (B) $\frac{12\sqrt{3}}{7}$
 (C) $\frac{15\sqrt{3}}{8}$ (D) $\frac{6\sqrt{3}}{7}$

157. The length of the common chord of two circles of radii 15 cm and 20 cm, whose centres are 25 cm apart, is

CAT 2002, Q53

- (A) 24 cm (B) 25 cm
 (C) 15 cm (D) 20 cm

158. Four horses are tethered at four corners of a square plot of side 14 m so that the adjacent horses can just reach one another. There is a small circular pond of area 20 m^2 at the centre. Find the ungrazed area.

CAT 2002, Q55

- (A) 22m^2 (B) 42m^2
 (C) 84m^2 (D) 168m^2

159. In the figure given below, ABCD is a rectangle. The area of the isosceles right triangle ABE = 7 cm^2 ; $EC = 3(BE)$. The area of ABCD (in cm^2) is



CAT 2002, Q57

- (A) 21 cm^2 (B) 28 cm^2
 (C) 42 cm^2 (D) 56 cm^2

160. The area of the triangle whose vertices are (a,a) , $(a+1, a+1)$ and $(a+2, a)$ is

CAT 2002, Q58

- (A) a^3 (B) 1
 (C) $2a$ (D) $2^{1/2}$

161. Instead of walking along two adjacent sides of a rectangular field, a boy took a short cut along the diagonal and saved a distance equal to half the longer side. Then the

ratio of the shorter side to the longer side is

CAT 2002, Q59

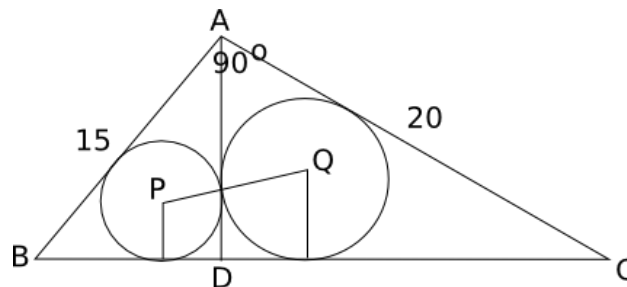
- (A) $\frac{1}{2}$ (B) $\frac{2}{3}$
(C) $\frac{1}{4}$ (D) $\frac{3}{4}$

162. Neeraj has agreed to mow a lawn, which is a $20 \text{ m} \times 40 \text{ m}$ rectangle. He mows it with 1 m wide strip. If Neeraj starts at one corner and mows around the lawn toward the centre, about how many times would he go round before he has mowed half the lawn? (Round off the answer to two decimal digits)

CAT 2002, Q65

- (A) 2.5 (B) 3.5
(C) 3.75 (D) None of these

163. In the following figure, ACB is a right-angled triangle. AD is the altitude. Circles are inscribed within the triangle ACD and triangle BCD . P and Q are the centers of the circles. The distance PQ is



The length of AB is 15 m and AC is 20 m

CAT 2002, Q90

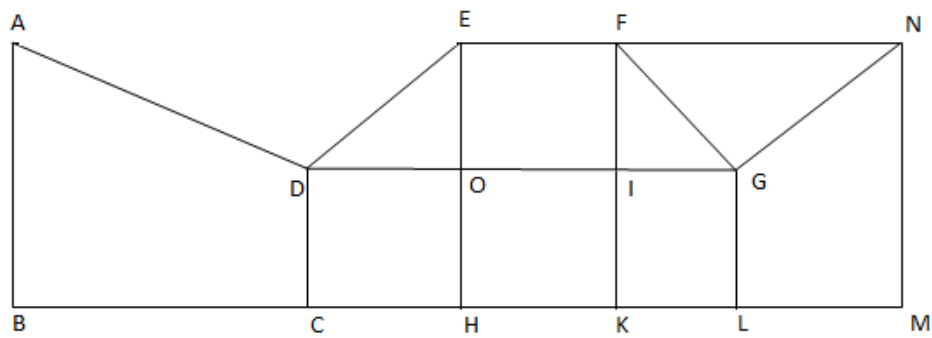
- (A) 7 m (B) 4.5 m
(C) 10.5 m (D) 6 m

Questions 164 to 165

Directions for the next two questions: Answer the questions based on the following diagram

In the following diagram, $\angle ABC = 90^\circ = \angle DCH = \angle DOE = \angle EHK = \angle FKL = \angle GLM = \angle LMN$

$AB = BC = 2CH = 2CD = EH = FK = 2HK = 4KL = 2LM = MN$



164. The magnitude of $\angle FGO =$

CAT 2002, Q98

- (A) 30° (B) 45°
 (C) 60° (D) None of these

165. What is the ratio of the areas of the two quadrilaterals ABCD to DEFG?

CAT 2002, Q99

- (A) 1 : 2 (B) 2 : 1
 (C) 12 : 7 (D) None of these

166. A square, whose side is 2 m, has its corners cut away so as to form an octagon with all sides equal. Then the length of each side of the octagon, in metres, is

CAT 2001, Q2

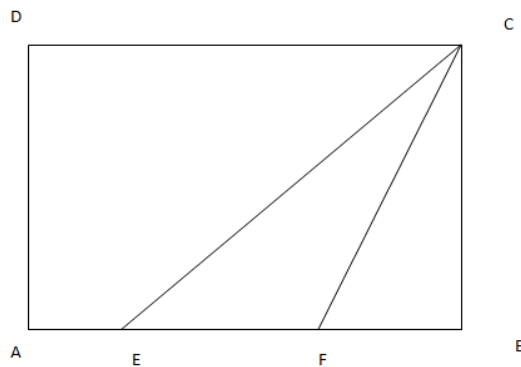
- (A) $\frac{\sqrt{2}}{\sqrt{2}+1}$ (B) $\frac{2}{\sqrt{2}+1}$
 (C) $\frac{2}{\sqrt{2}-1}$ (D) $\frac{\sqrt{2}}{\sqrt{2}-1}$

167. A certain city has a circular wall around it, and this wall has four gates pointing north, south, east and west. A house stands outside the city, 3 km north of the north gate, and it can just be seen from a point 9 km east of the south gate. What is the diameter of the wall that surrounds the city?

CAT 2001, Q7

- (A) 6 km (B) 9 km
 (C) 12 km (D) None of these

168. In the given diagram, ABCD is a rectangle with $AE = EF = FB$. What is the ratio of the areas of CEF and that of the rectangle?



CAT 2001, Q8

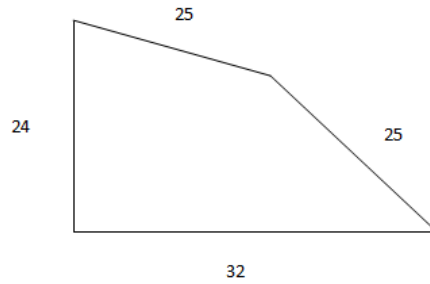
- (A) $\frac{1}{6}$ (B) $\frac{1}{8}$
 (C) $\frac{1}{9}$ (D) None of these

169. A ladder leans against a vertical wall. The top of the ladder is 8 m above the ground. When the bottom of the ladder is moved 2 m farther away from the wall, the top of the ladder rests against the foot of the wall. What is the length of the ladder?

CAT 2001, Q16

- (A) 10 m (B) 15 m
 (C) 20 m (D) 17 m

170. Two sides of a plot measure 32 m and 24 m and the angle between them is a perfect right angle. The other two sides measure 25 m each and the other three angles are not right angles. What is the area of the plot?



CAT 2001, Q23

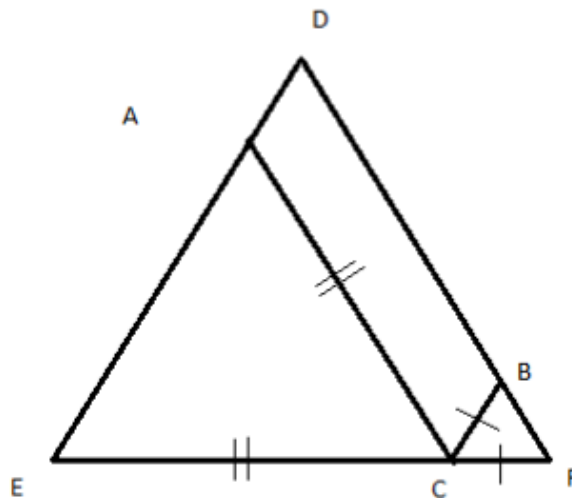
- (A) 768 m^2 (B) 534 m^2
 (C) 696.5 m^2 (D) 684 m^2

171. Euclid has a triangle in mind. Its longest side has length 20 and another of its sides has length 10. Its area is 80. What is the exact length of its third side?

CAT 2001, Q29

- (A) $\sqrt{260}$ (B) $\sqrt{250}$
 (C) $\sqrt{240}$ (D) $\sqrt{270}$

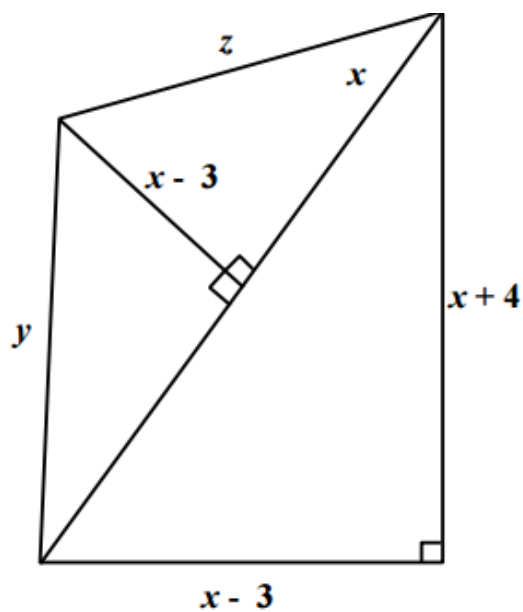
172. In triangle DEF shown below, points A, B and C are taken on DE, DF and EF respectively such that $EC = AC$ and $CF = BC$. If angle D equals 40 degrees , then angle ACB is ?



CAT 2001, Q34

- (A) 140 (B) 70
 (C) 100 (D) None of these

173. Based on the figure below, what is the value of x , if $y = 10$?



CAT 2001, Q40

- (A) 10
(B) 11
(C) 12
(D) None of these

174. A rectangular pool of 20 m wide and 60 m long is surrounded by a walkway of uniform width. If the total area of the walkway is 516 m^2 , how wide, in metres, is the walkway?

CAT 2001, Q41

- (A) 4 m
(B) 2 m
(C) 3 m
(D) 3.5 m

CAT 2000 - Questions 175-180

175. What is the number of distinct triangles with integral valued sides and perimeter 14?

CAT 2000, Q67

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

176. ABCD is a rhombus with the diagonals AC and BD intersection at the origin on the x-y plane. The equation of the straight line AD is $x + y = 1$. What is the equation of BC?

CAT 2000, Q96

- (A) $x+y=-1$
(B) $x-y=-1$
(C) $x+y=1$
(D) None of the above

177. Consider a circle with unit radius. There are 7 adjacent sectors, $S_1, S_2, S_3, \dots, S_7$ in the circle such that their total area is $(1/8)$ th of the area of the circle. Further, the area of the j^{th} sector is twice that of the $(j-1)^{th}$ sector, for $j=2, \dots, 7$. What is the angle, in radians, subtended by the arc of S_1 at the centre of the circle?

CAT 2000, Q97

- (A) $\pi/508$
(B) $\pi/2040$
(C) $\pi/1016$
(D) $\pi/1524$

178. The area bounded by the three curves $|x+y| = 1$, $|x| = 1$, and $|y| = 1$, is equal to:

CAT 2000, Q99

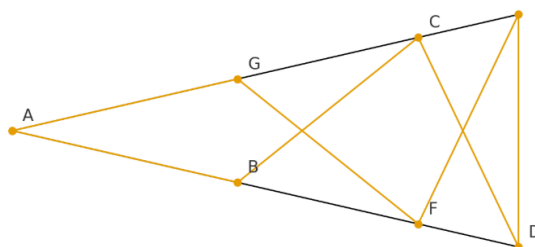
- (A) 4
(B) 3
(C) 2
(D) 1

179. If a, b, c are the sides of a triangle, and $a^2 + b^2 + c^2 = bc + ca + ab$, then the triangle is:

CAT 2000, Q101

- (A) equilateral
(B) isosceles
(C) right angled
(D) obtuse angled

180. In the figure $AB=BC=CD=DE=EF=FG=GA$, then $\angle DAE$ is approximately

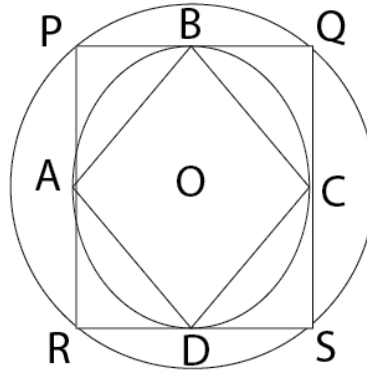


CAT 2000, Q102

- (A) 15°
(B) 20°
(C) 30°
(D) 25°

CAT 1999 - Questions 181-183

181. The figure below shows two concentric circles with centre O. PQRS is a square, inscribed in the outer circle. It also circumscribes the inner circle, touching it at points B, C, D and A. What is the ratio of the perimeter of the outer circle to that of polygon ABCD?



CAT 1999, Q68

- (A) $\frac{\pi}{4}$ (B) $\frac{3\pi}{2}$
 (C) $\frac{\pi}{2}$ (D) π

182. There is a circle of radius 1 cm. Each member of a sequence of regular polygons $S_1(n)$, $n = 4, 5, 6, \dots$, where n is the number of sides of the polygon, is circumscribing the circle; and each member of the sequence of regular polygons $S_2(n)$, $n = 4, 5, 6, \dots$ where n is the number of sides of the polygon, is inscribed in the circle. Let $L_1(n)$ and $L_2(n)$ denote the perimeters of the corresponding polygons of $S_1(n)$ and $S_2(n)$. Then $\frac{L_1(13) + 2\pi}{L_2(17)}$ is

CAT 1999, Q73

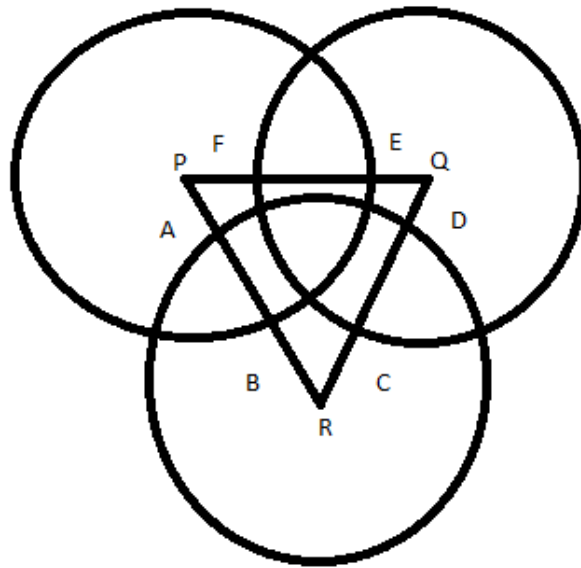
- (A) greater than $\frac{\pi}{4}$ and less than 1 (B) greater than 1 and less than 2
 (C) greater than 2 (D) less than $\frac{\pi}{4}$

183. There is a square field with each side 500 metres long. It has a compound wall along its perimeter. At one of its corners, a triangular area of the field is to be cordoned off by erecting a straight line fence. The compound wall and the fence will form its borders. If the length of the fence is 100 metres, what is the maximum area in square metres that can be cordoned off?

CAT 1999, Q74

- (A) 2,500 (B) 10,000
 (C) 5,000 (D) 20,000

184. Three circles, each of radius 20, have centres at P, Q and R. Further, $AB = 5$, $CD = 10$ and $EF = 12$. What is the perimeter of ΔPQR ?



CAT 1998, Q56

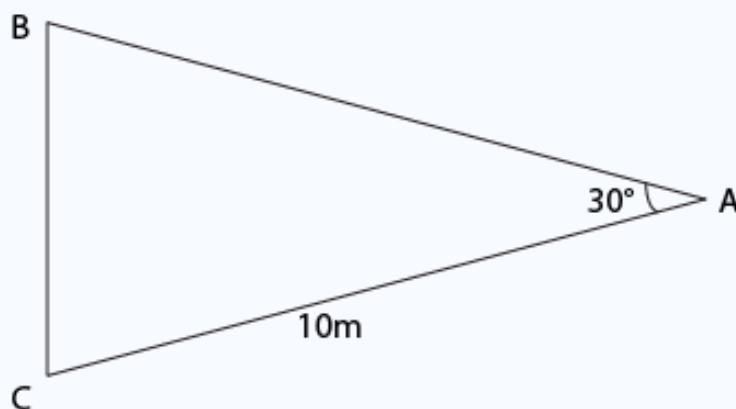
- (A) 120 (B) 66
(C) 93 (D) 87

Questions 185 to 186

Answer the questions based on the following information. A cow is tethered at point A by a rope. Neither the rope nor the cow is allowed to enter ΔABC .

$$\angle BAC = 30^\circ$$

$$I(AB) = I(AC) = 10 \text{ m}$$



185. What is the area that can be grazed by the cow if the length of the rope is 8 m?

CAT 1998, Q65

(A) $134\pi\frac{1}{3}$ sq.m

(B) 121π sq. m

(C) 132π sq. m

(D) $176\frac{\pi}{3}$ sq. m

186. What is the area that can be grazed by the cow if the length of the rope is 12 m?

CAT 1998, Q66

(A) $\frac{403\pi}{3}$ sq. m

(B) 121π sq. m

(C) 132π sq. m

(D) $176\frac{\pi}{3}$ sq. m

187. Four identical coins are placed in a square. For each coin the ratio of area to circumference is same as the ratio of circumference to area. Then find the area of the square that is not covered by the coins.

CAT 1998, Q71

(A) $16(\pi - 1)$

(B) $16(8 - \pi)$

(C) $16(4 - \pi)$

(D) $16\left(4 - \frac{\pi}{2}\right)$

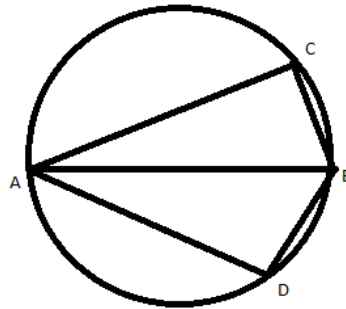
CAT 1997 - Questions 188-194

188. The sum of the areas of two circles, which touch each other externally, is 153π . If the sum of their radii is 15, find the ratio of the larger to the smaller radius.

CAT 1997, Q119

- (A) 4
(B) 2
(C) 3
(D) None of these

189.

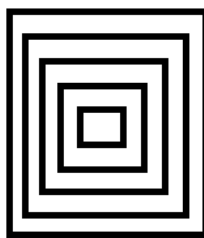


AB is the diameter of the given circle, while points C and D lie on the circumference as shown. If AB is 15 cm, AC is 12 cm and BD is 9 cm, find the area of the quadrilateral ACBD.

CAT 1997, Q126

- (A) 54sq. cm
(B) 216sq. cm
(C) 162sq. cm
(D) None of these

190. The adjoining figure shows a set of concentric squares. If the diagonal of the innermost square is 2 units, and if the distance between the corresponding corners of any two successive squares is 1 unit, find the difference between the areas of the eighth and the seventh squares, counting from the innermost square.



CAT 1997, Q132

- (A) $10\sqrt{2}$ sq. units
(B) 30 sq. units
(C) $35\sqrt{2}$ sq. units
(D) None of these

191. In $\triangle ABC$, points P, Q and R are the mid-points of sides AB, BC and CA respectively. If area of $\triangle ABC$ is 20 sq. units, find the area of $\triangle PQR$.

CAT 1997, Q135

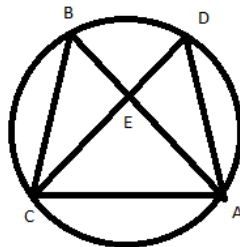
- (A) 10 sq. units
(B) $5\sqrt{3}$ sq. units
(C) 5 sq. units
(D) None of these

192. In a rectangle, the difference between the sum of the adjacent sides and the diagonal is half the length of the longer side. What is the ratio of the shorter to the longer side?

CAT 1997, Q136

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

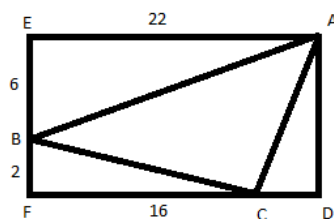
193. In the adjoining figure, points A, B, C and D lie on the circle. $AD = 24$ and $BC = 12$. What is the ratio of the area of $\triangle CBE$ to that of $\triangle ADE$?



CAT 1997, Q142

- (A) $1 : 4$
(B) $1 : 2$
(C) $1 : 3$
(D) Data insufficient

194. In the given figure, EADF is a rectangle and $\triangle ABC$ is a triangle whose vertices lie on the sides of EADF and $AE = 22$, $BE = 6$, $CF = 16$ and $BF = 2$. Find the length of the line joining the mid-points of the sides AB and BC.



(A) 4.2

(B) 5

(C) 3.5

(D) None of these

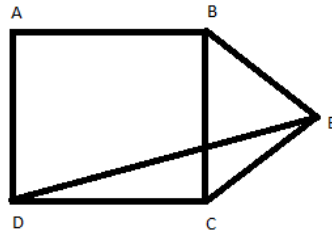
CAT 1996 - Questions 195-202

195. A cube of side 12 cm is painted red on all the faces and then cut into smaller cubes, each of side 3 cm. What is the total number of smaller cubes having none of their faces painted?

CAT 1996, Q110

- (A) 16 (B) 8
(C) 12 (D) 24

196. If ABCD is a square and BCE is an equilateral triangle, what is the measure of $\angle DEC$?



CAT 1996, Q111

- (A) 15° (B) 30°
(C) 20° (D) 45°

197. From a circular sheet of paper with a radius 20 cm, four circles of radius 5 cm each are cut out. What is the ratio of the uncut to the cut portion?

CAT 1996, Q113

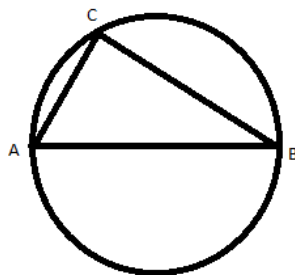
- (A) 1 : 3 (B) 4 : 1
(C) 3 : 1 (D) 4 : 3

198. A wooden box of thickness 0.5 cm, length 21 cm, width 11 cm and height 6 cm is painted on the inside. The expenses of painting are Rs. 70. What is the rate of painting per square centimetres?

CAT 1996, Q114

- (A) Rs 0.7 (B) Rs 0.5
(C) Rs 0.1 (D) Rs 0.2

199. The figure shows a circle of diameter AB and radius 6.5 cm. If chord CA is 5 cm long, find the area of triangle ABC.



CAT 1996, Q119

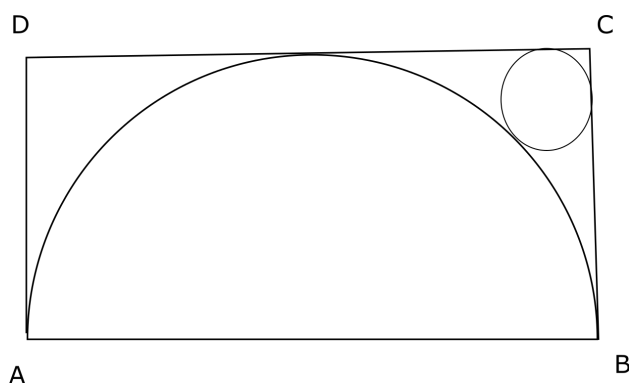
- (A) 60 sq. cm
(B) 30 sq. cm
(C) 40 sq. cm
(D) 52 sq. cm

200. In triangle ABC, $\angle B$ is a right angle, $AC = 6$ cm, and D is the mid-point of AC. The length of BD is

CAT 1996, Q123

- (A) 4cm
(B) 6 cm
(C) 3cm
(D) 3.5cm

201. The figure shows the rectangle ABCD with a semicircle and a circle inscribed inside in it as shown. What is the ratio of the area of the circle to that of the semicircle?



CAT 1996, Q129

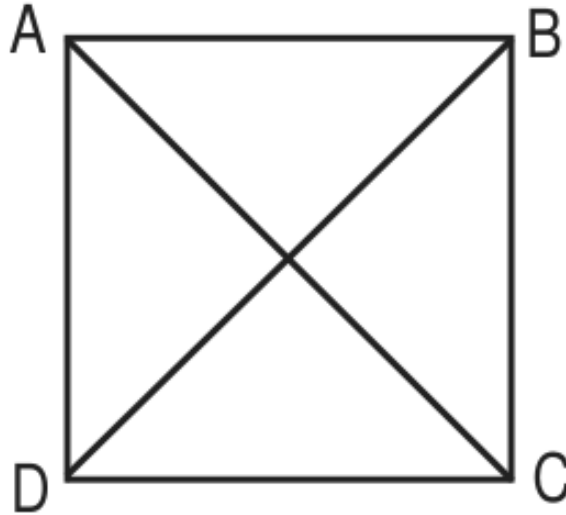
- (A) $(\sqrt{2} - 1)^2 : 1$
(B) $2(\sqrt{2} - 1)^2 : 1$
(C) $(\sqrt{2} - 1)^2 : 2$
(D) None of these

202. The points of intersection of three lines $2x + 3y - 5 = 0$, $5x - 7y + 2 = 0$ and $9x - 5y - 4 = 0$

CAT 1996, Q137

- (A) form a triangle
(B) are on lines perpendicular to each other
(C) are on lines parallel to each other
(D) are coincident

203. ABCD is a square of area 4, which is divided into four non-overlapping triangles as shown in the figure (both diagonals AC and BD are drawn, meeting at the centre). Then the sum of the perimeters of the triangles is



CAT 1995, Q51

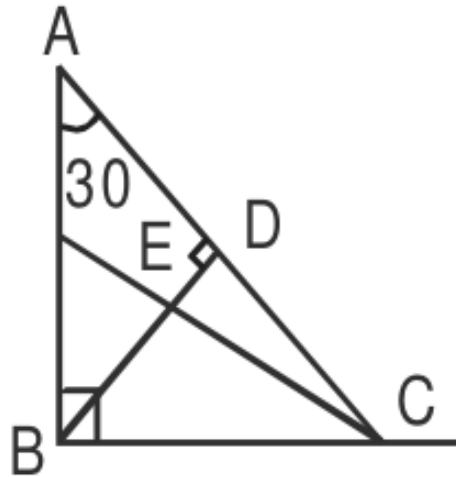
- (A) $8(2 + \sqrt{2})$ (B) $8(1 + \sqrt{2})$
(C) $4(1 + \sqrt{2})$ (D) $4(2 + \sqrt{2})$

204. Which one of the following cannot be the ratio of angles in a right-angled triangle?

CAT 1995, Q61

- (A) 1 : 2 : 3 (B) 1 : 1 : 2
(C) 1 : 3 : 6 (D) None of these

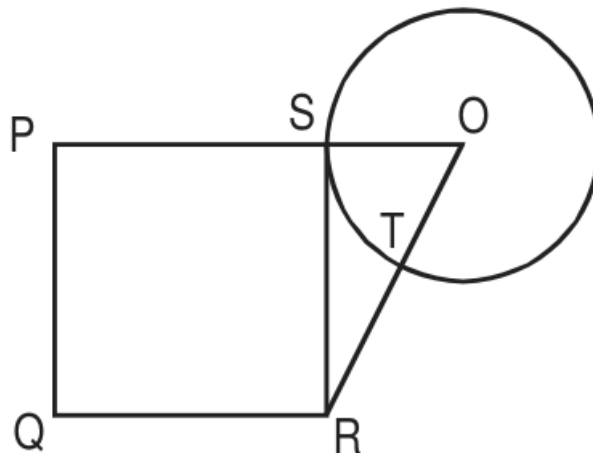
205. In triangle ABC, $AB \perp BC$, $BD \perp AC$ and CE bisects $\angle C$, where $\angle A = 30^\circ$. Then what is $\angle CED$?



CAT 1995, Q65

- (A) 30° (B) 60°
(C) 45° (D) 65°

206. PQRS is a square. SR is a tangent (at point S) to the circle with centre O, and $TR = OS$. Then the ratio of the area of the circle to the area of the square is



CAT 1995, Q68

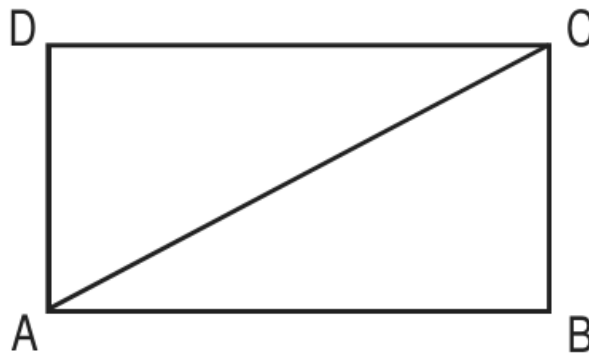
- (A) $\pi/3$ (B) $11/7$
(C) $3/\pi$ (D) $7/11$

207. The sides of a triangle are 5, 12 and 13 units. A rectangle is constructed, which is equal in area to the triangle, and has a width of 10 units. Then the perimeter of the rectangle is

CAT 1995, Q75

- (A) 30 units (B) 36 units
(C) 13 units (D) None of these

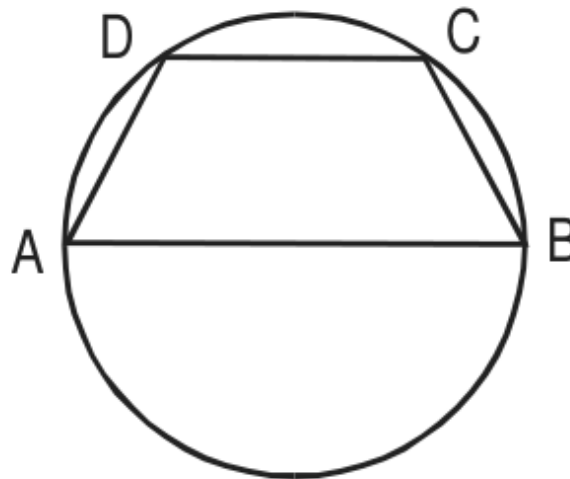
208. In the adjoining figure, ABCD is a rectangle with diagonal AC drawn. $AC + AB = 5AD$ and $AC - AD = 8$. Then the area of the rectangle ABCD is



CAT 1995, Q76

- (A) 36 (B) 50
(C) 60 (D) Cannot be answered

209. In the given figure, AB is a diameter of the circle and points C and D are on the circumference such that $\angle CAD = 30^\circ$ and $\angle CBA = 70^\circ$. What is the measure of $\angle ACD$?



CAT 1995, Q78

- (A) 40° (B) 50°
(C) 30° (D) 90°

210. The length of a ladder is exactly equal to the height of the wall it is leaning against. If the lower end of the ladder is kept on a stool of height 3 m and the stool is kept 9 m away from the wall, the upper end of the ladder coincides with the top of the wall. Then the height of the wall is

CAT 1995, Q79

- (A) 12 m (B) 15 m
(C) 18 m (D) 11 m

CAT 1994 - Questions 211-213

211. A right circular cone, a right circular cylinder and a hemisphere, all have the same radius, and the heights of cone and cylinder equal their diameters. Then their volumes are proportional, respectively to

CAT 1994, Q56

- (A) 1 : 3 : 1
(B) 2 : 1 : 3
(C) 3 : 2 : 1
(D) 1 : 2 : 3
-

212. A right circular cone of height h is cut by a plane parallel to the base and at a distance $h/3$ from the base, then the volumes of the resulting cone and the frustum are in the ratio

CAT 1994, Q59

- (A) 1 : 3
(B) 8 : 19
(C) 1 : 4
(D) 1 : 7
-

213. Four friends start from four towns, which are at the four corners of an imaginary rectangle. They meet at a point which falls inside the rectangle, after travelling distances of 40, 50 and 60 metres. The maximum distance that the fourth could have traveled is (approximately)

CAT 1994, Q72

- (A) 67 metres
(B) 52 metres
(C) 22.5 metres
(D) Cannot be determined
-

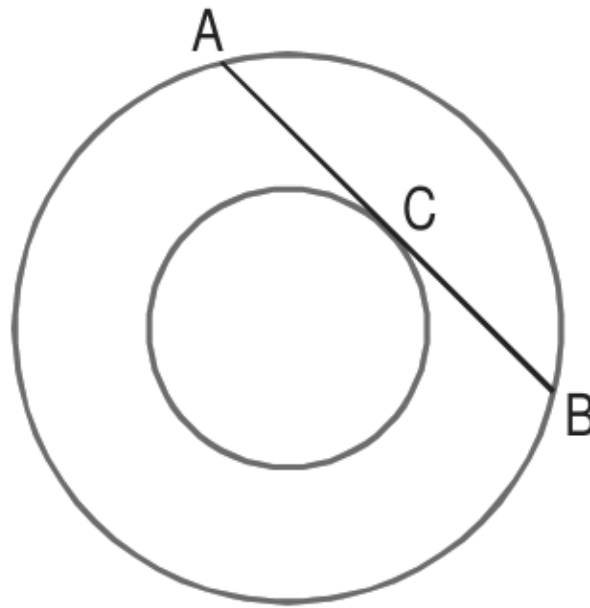
CAT 1993 - Questions 214-219

214. Three identical cones with base radius r are placed on their bases so that each is touching the other two. The radius of the circle drawn through their vertices is

CAT 1993, Q66

- (A) smaller than r .
(B) equal to r .
(C) larger than r .
(D) depends on the height of the cones.

215. The line AB is 6 metres in length and is tangent to the inner one of the two concentric circles at point C . It is known that the radii of the two circles are integers. The radius of the outer circle is



CAT 1993, Q67

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

216. Use the following information: ABC forms an equilateral triangle in which B is 2 km from A . A person starts walking from B in a direction parallel to AC and stops when he reaches a point D directly east of C . He, then, reverses direction and walks till he reaches a point E directly south of C .

78. Then D is

CAT 1993, Q78

- (A) 3 km east and 1 km north of A
(B) 3 km east and $\sqrt{3}$ km north of A
(C) $\sqrt{3}$ km east and 1 km south of A
(D) $\sqrt{3}$ km west and 3 km north of A

217. The total distance walked by the person is

CAT 1993, Q79

- (A) 3 km
(B) 4 km
(C) $2\sqrt{3}$ km
(D) 6 km

218. A slab of ice 8 inches in length, 11 inches in breadth, and 2 inches thick was melted and resolidified into the form of a rod of 8 inches diameter. The length of such a rod, in inches, is nearest to

CAT 1993, Q80

- | | |
|-------|---------|
| (A) 3 | (B) 3.5 |
| (C) 4 | (D) 4.5 |
-

219. The diameter of a hollow cone is equal to the diameter of a spherical ball. If the ball is placed at the base of the cone, what portion of the ball will be outside the cone?

CAT 1993, Q96

- | | |
|-------------------|-------------------|
| (A) 50% | (B) less than 50% |
| (C) more than 50% | (D) 100% |
-

CAT 1991 - Questions 220-225

220. Let the consecutive vertices of a square S be A, B, C & D . Let E, F & G be the mid-points of the sides AB, BC & AD respectively of the square. Then the ratio of the area of the quadrilateral $EFDG$ to that of the square S is nearest to

CAT 1991, Q69

- (A) $1/2$ (B) $1/3$
(C) $1/4$ (D) $1/8$

221. A circle is inscribed in a given square and another circle is circumscribed about the square. What is the ratio of the area of the inscribed circle to that of the circumscribed circle?

CAT 1991, Q73

- (A) $2 : 3$ (B) $3 : 4$
(C) $1 : 4$ (D) $1 : 2$

222. A square piece of cardboard of sides ten inches is taken and four equal squares pieces are removed at the corners, such that the side of this square piece is also an integer value. The sides are then turned up to form an open box. Then the maximum volume such a box can have is

CAT 1991, Q81

- (A) 72 cubic inches. (B) 24.074 cubic inches.
(C) $\frac{2000}{27}$ cubic inches (D) 64 cubic inches.

223. A one rupee coin is placed on a table. The maximum number of similar one rupee coins which can be placed on the table, around it, with each one of them touching it and only two others is

CAT 1991, Q88

- (A) 8 (B) 6
(C) 10 (D) 4

224. A man starting at a point walks one km east, then two km north, then one km east, then one km north, then one km east and then one km north to arrive at the destination. What is the shortest distance from the starting point to the destination?

CAT 1991, Q95

- (A) $2\sqrt{2}$ km (B) 7 km
(C) $3\sqrt{2}$ km (D) 5 km

225. What is the distance between the points $A(3, 8)$ and $B(-2, -7)$?

CAT 1991, Q100

- (A) $5\sqrt{2}$ (B) 5
(C) $5\sqrt{10}$ (D) $10\sqrt{2}$

- End of PYQ Collection -