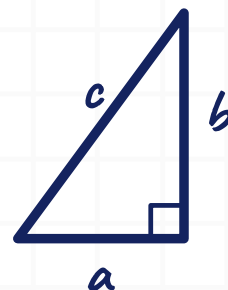
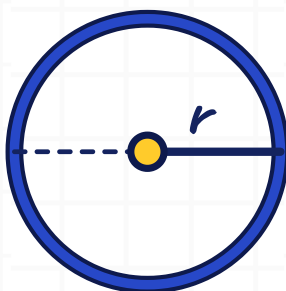


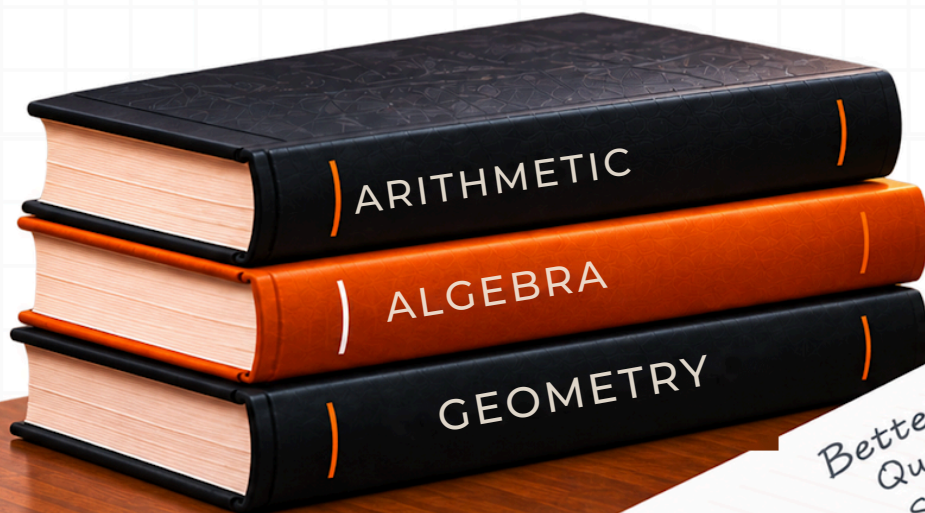
CAT PYQ

Mensuration 2D

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



$$D = S \times T$$



Better
Questions
Stronger
Concepts
Brighter Future

44 Questions

Quantitative Aptitude

Years: 1996-2025

General Instructions

- (i) This collection contains **44 Quantitative Aptitude questions** classified under **Mensuration 2D**, following the supplied CD PYQ sheet.
- (ii) **Coverage:** CAT 1996-2025. Questions are grouped by their source year and sitting, with continuous numbering from **1 to 44**.
- (iii) This collection has **39 multiple choice questions (MCQs)** and **5 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 1-1

1. 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 2-2

2. 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

CAT 2025 Slot 3 - Questions 3-3

3. 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

CAT 2023 Slot 2 - Questions 4-5

4. 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

5. 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.

6. 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) $\sqrt{2} : 1$

CAT 2022 Slot 1 - Questions 7-8

7. 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.

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

9. 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) $2\sqrt{6}$

CAT 2021 Slot 2 - Questions 10-11

10. 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) $\frac{\sqrt{13} + \sqrt{12}}{2}$

11. 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

CAT 2021 Slot 3 - Questions 12-12

12. 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

CAT 2020 Slot 1 - Questions 13-15

13. 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.

14. 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) $5\sqrt{\pi}(3 + \frac{9}{\pi})$

15. 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 16-16

16. 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

CAT 2020 Slot 3 - Questions 17-18

17. 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.

18. 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

CAT 2018 Slot 2 - Questions 19-21

19. 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) $s \leq 6$
-

20. 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
-

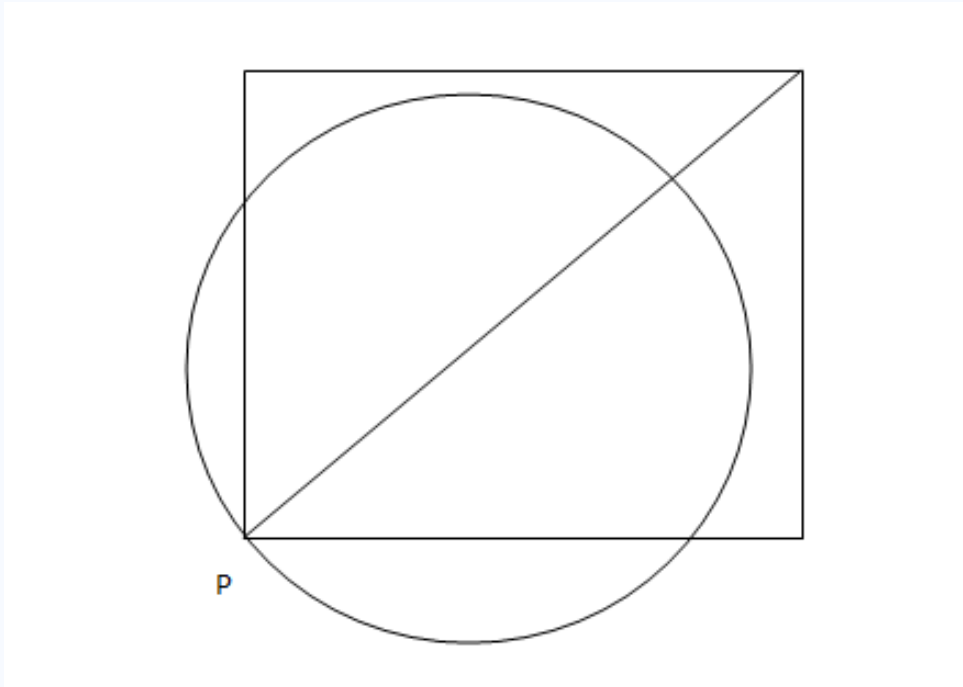
21. From a rectangle ABCD of area 768 sq cm, a semicircular part with diameter AB and area 72π sq cm is removed. The perimeter of the leftover portion, in cm, is

25 Nov 2018, Slot 2, Q88

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

Questions 22 to 23

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:



22. 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) $(14 - 3\pi)/6$

23. 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) $(\pi - 2)/4$

24. 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%

25. 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

26. 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

27. 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

28. 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) $\frac{4n - \pi}{n(4 - \pi)}$

29. 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) $s > c > t$

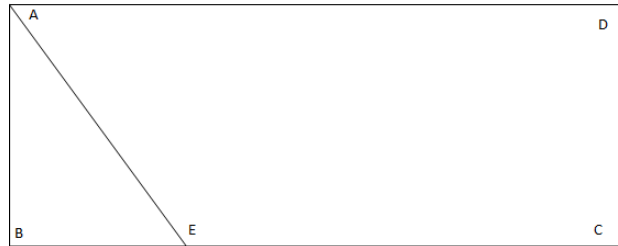
CAT 2002 - Questions 30-33

30. 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

31. 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

32. 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) $1/2$ (B) $2/3$
(C) $1/4$ (D) $3/4$

33. 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

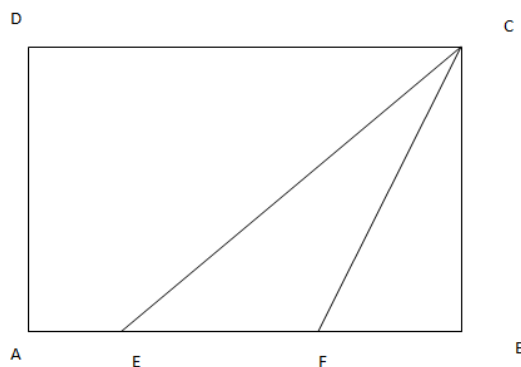
CAT 2001 - Questions 34-37

34. 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

- | | |
|--|--|
| <p>(A) $\frac{\sqrt{2}}{\sqrt{2} + 1}$</p> <p>(C) $\frac{2}{\sqrt{2} - 1}$</p> | <p>(B) $\frac{2}{\sqrt{2} + 1}$</p> <p>(D) $\frac{\sqrt{2}}{\sqrt{2} - 1}$</p> |
|--|--|

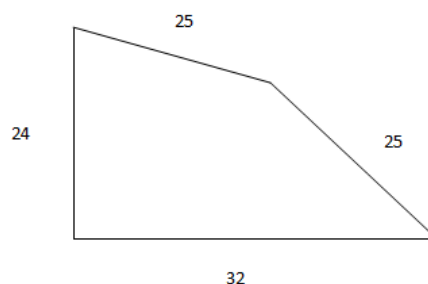
35. In the given diagram, ABCD is a rectangle with AE = EF = FB. What is the ratio of the areas of CEF and that of the rectangle?



CAT 2001, Q8

- | | |
|---|--|
| <p>(A) $\frac{1}{6}$</p> <p>(C) $\frac{1}{9}$</p> | <p>(B) $\frac{1}{8}$</p> <p>(D) None of these</p> |
|---|--|

36. 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

- | | |
|---|---|
| <p>(A) 768 m^2</p> <p>(C) 696.5 m^2</p> | <p>(B) 534 m^2</p> <p>(D) 684 m^2</p> |
|---|---|

37. 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 1999 - Questions 38-38

38. There is a square field with each side 500 metres long. It has a compound wall along its perimeter. At one of its comers, 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

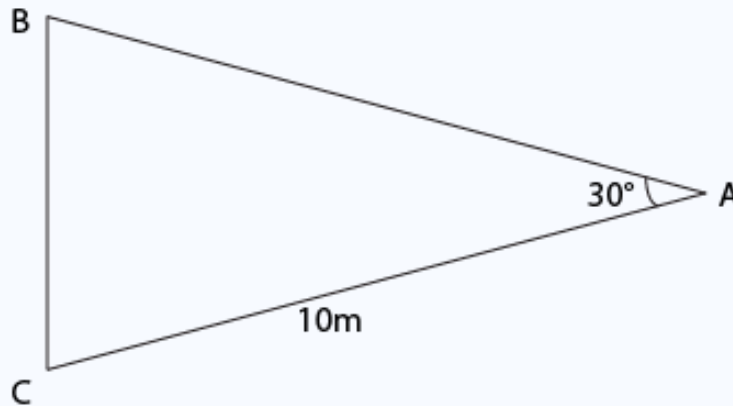
(D) 20,000

Questions 39 to 40

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 $\triangle ABC$.

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

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



39. 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

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

CAT 1998, Q66

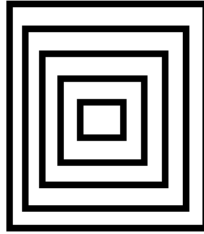
- (A) $\frac{403\pi}{3}$ sq. m (B) 121π sq. m
(C) 132π sq. m (D) $176\frac{\pi}{3}$ sq. m

41. 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) $16(4 - \frac{\pi}{2})$

42. 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

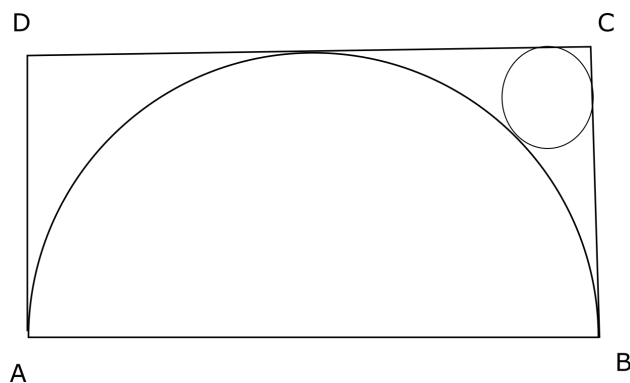
CAT 1996 - Questions 43-44

43. 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

44. 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

- End of PYQ Collection -