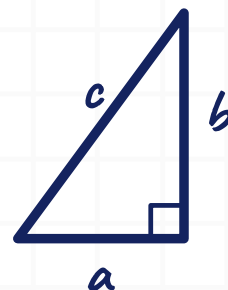
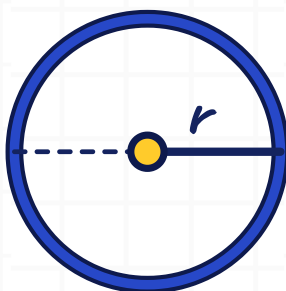


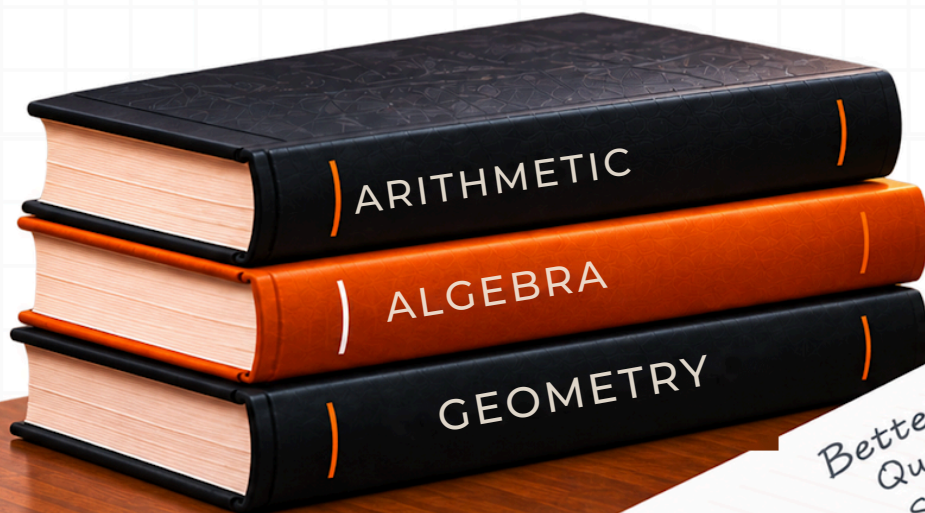
CAT PYQ

Mensuration 3D

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



$$D = S \times T$$



Better
Questions
Stronger
Concepts
Brighter Future

20 Questions

Quantitative Aptitude

Years: 1991-2024

General Instructions

- (i) This collection contains **20 Quantitative Aptitude questions** classified under **Mensuration 3D**, following the supplied CD PYQ sheet.
- (ii) **Coverage:** CAT 1991-2024. Questions are grouped by their source year and sitting, with continuous numbering from **1 to 20**.
- (iii) This collection has **18 multiple choice questions (MCQs)** and **2 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 2024 Slot 1 - Questions 1-1

1. 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 2020 Slot 1 - Questions 2-2

2. 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 |
-

CAT 2019 Slot 1 - Questions 3-3

3. 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) $\sqrt{2} : \sqrt{3}$

CAT 2019 Slot 2 - Questions 4-5

4. 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) $5\sqrt{5}$
-

5. 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) $1044(4 + \pi)$
-

CAT 2018 Slot 1 - Questions 6-6

6. 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.

CAT 2017 Slot 1 - Questions 7-8

7. A solid metallic cube is melted to form five solid cubes whose volumes are in the ratio 1 : 1 : 8 : 27 : 27. The percentage by which the sum of the surface areas of these five cubes exceeds the surface area of the original cube is nearest to

26 Nov 2017, Slot 1, Q84

- (A) 10 (B) 50
(C) 60 (D) 20

8. A ball of diameter 4 cm is kept on top of a hollow cylinder standing vertically. The height of the cylinder is 3 cm, while its volume is 9π cubic centimeters. Then the vertical distance, in cm, of the topmost point of the ball from the base of the cylinder is

26 Nov 2017, Slot 1, Q85

Type in the answer.

CAT 2017 Slot 2 - Questions 9-9

9. 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 |
-

CAT 2008 - Questions 10-10

10. 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.

16 Nov 2008, Q25

(A) $\frac{100\pi}{3}$
(C) $\frac{120\pi}{7}$
(E) $\frac{110\pi}{7}$

(B) $\frac{80\pi}{3}$
(D) $\frac{130\pi}{9}$

CAT 2006 - Questions 11-11

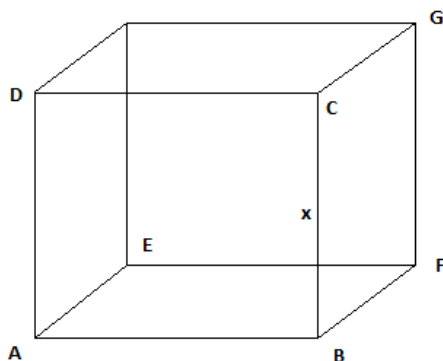
11. The length, breadth and height of a room are in the ratio 3:2:1. If the breadth and height are halved while the length is doubled, then the total area of the four walls of the room will

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%
-

CAT 2004 - Questions 12-12

12. 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?



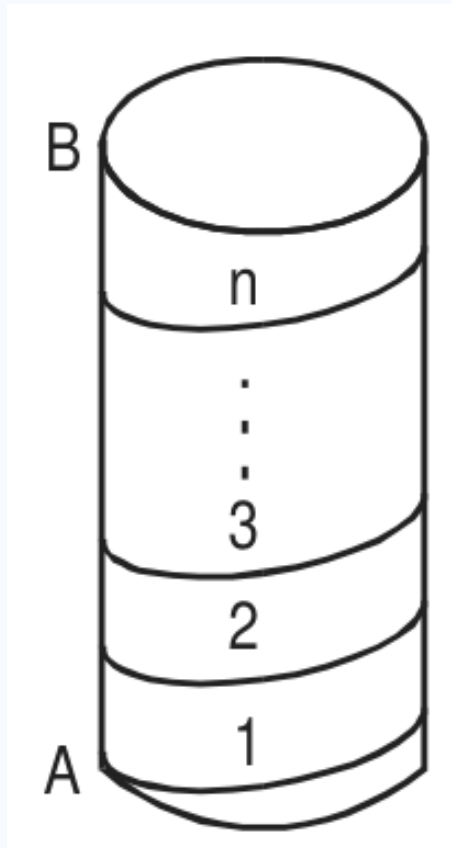
21 Nov 2004, Q65

- (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

Questions 13 to 15

Directions for Questions 13 to 15: 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).



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

15 Feb 2004, CAT 2003 Re-test, Q57

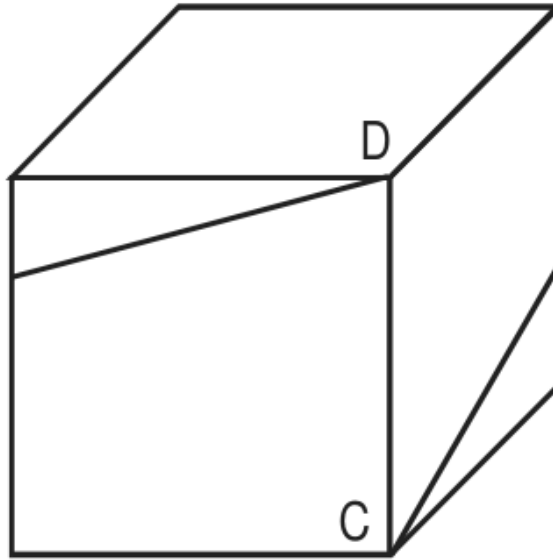
(A) $\frac{h}{n}$ cm

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

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

(D) Cannot be determined

14. 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

15. 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) $h = \sqrt{13}n$

16. 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 (B) 4
(C) 1 (D) 2

CAT 2003 Original sitting (23 Nov 2003) - Questions 17-17

17. 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 |
-

CAT 1996 - Questions 18-19

18. 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 |
-

19. 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 |
-

CAT 1991 - Questions 20-20

20. 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.

- End of PYQ Collection -
