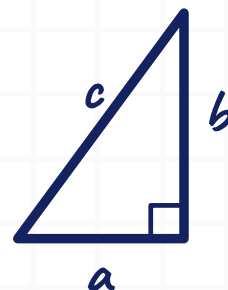
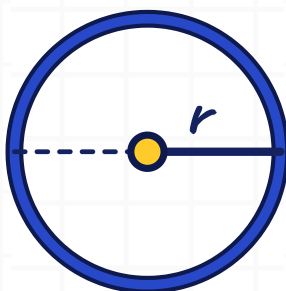


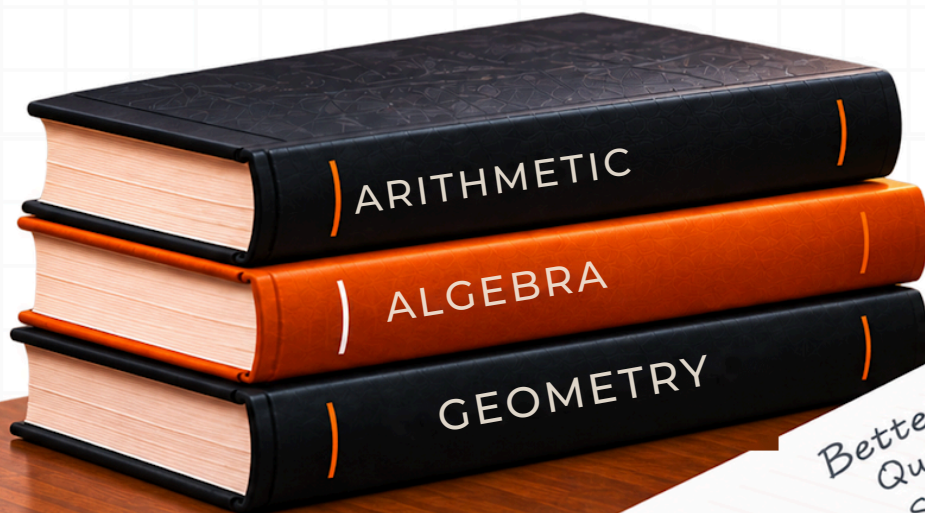
CAT PYQ

Triangles

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



$$D = S \times T$$



Better
Questions
Stronger
Concepts
Brighter Future

43 Questions

Quantitative Aptitude

Years: 1996-2025

General Instructions

- (i) This collection contains **43 Quantitative Aptitude questions** classified under **Triangles**, 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 43**.
- (iii) This collection has **33 multiple choice questions (MCQs)** and **10 Type In The Answer (TITA) questions**. Read every option before choosing the answer. Enter a response for questions marked "Type in the answer."
- (iv) Original mathematical expressions, question wording and option order are retained. Use the diagrams and data provided with each question.
- (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 2 - Questions 1-1

1. 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 2-3

2. 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.

3. 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 4-4

4. 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.

5. 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

CAT 2024 Slot 3 - Questions 6-6

6. 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 7-7

7. 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.

8. 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) $\frac{abr^2}{a^2 + b^2}$

CAT 2023 Slot 3 - Questions 9-9

9. 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) $2 \sin 15^\circ$

10. 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 11-11

11. 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.

CAT 2021 Slot 1 - Questions 12-12

12. 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 13-13

13. 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 14-14

14. 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

15. 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 2019 Slot 1 - Questions 16-16

16. 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 17-18

17. 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) $6\sqrt{2}$ |
-

18. 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 |
-

CAT 2017 Slot 1 - Questions 19-20

19. From a triangle ABC with sides of lengths 40 ft, 25 ft and 35 ft, a triangular portion GBC is cut off where G is the centroid of ABC. The area, in sq ft, of the remaining portion of triangle ABC is

26 Nov 2017, Slot 1, Q82

(A) $225\sqrt{3}$

(B) $\frac{500}{\sqrt{3}}$

(C) $\frac{275}{\sqrt{3}}$

(D) $\frac{250}{\sqrt{3}}$

20. Let ABC be a right-angled triangle with BC as the hypotenuse. Lengths of AB and AC are 15 km and 20 km, respectively. The minimum possible time, in minutes, required to reach the hypotenuse from A at a speed of 30 km per hour is

26 Nov 2017, Slot 1, Q86

Type in the answer.

CAT 2017 Slot 2 - Questions 21-21

21. 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 22-23

22. 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 | |
-

23. 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 | |
-

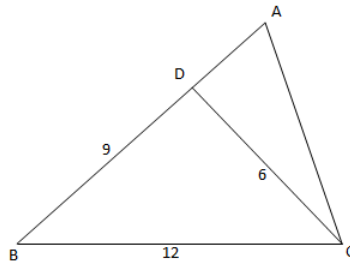
24. An equilateral triangle DOC is drawn inside a square ABCD. What is the value of the angle AOB in degrees?

19 Nov 2006, Q74

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

CAT 2005 - Questions 25-25

25. 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

26. 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

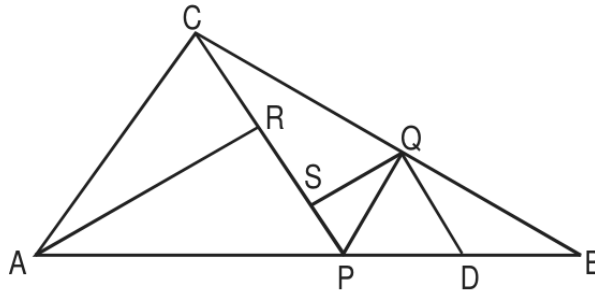
(A) 0.9

(B) 0.75

(C) 0.6

(D) 0.45

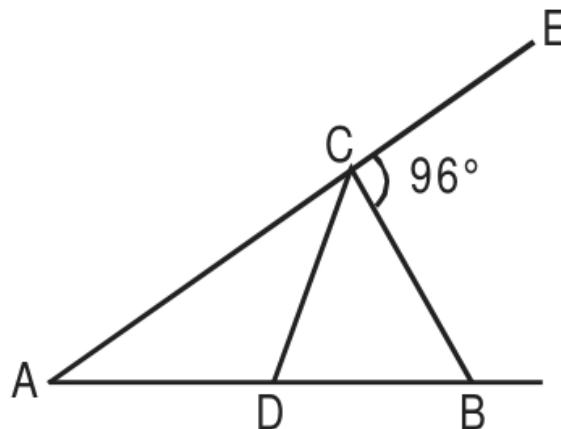
27. In the figure (not drawn to scale) given below, P is a point on AB such that $AP : PB = 4 : 3$. PQ is parallel to AC and QD is parallel to CP. In $\triangle ARC$, $\angle ARC = 90^\circ$, and in $\triangle PQS$, $\angle PSQ = 90^\circ$. The length of QS is 6 cm. What is the ratio $AP : PD$?



15 Feb 2004, CAT 2003 Re-test, Q61

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

28. 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

29. 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
(B) 16.565
(C) 15.465
(D) 14.365

30. 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

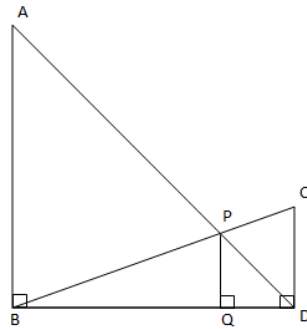
(A) $\frac{10\sqrt{19} + 26}{3}$

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

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

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

31. 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.

32. 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) $\frac{6\sqrt{3}}{7}$

CAT 2001 - Questions 33-36

33. 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

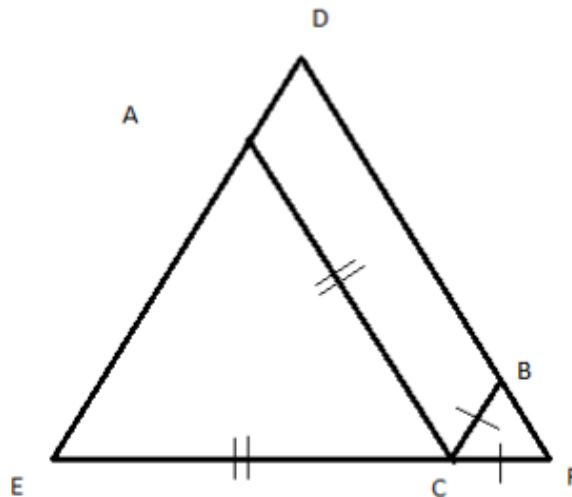
- (A) 10 m (B) 15 m
(C) 20 m (D) 17 m

34. 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) $\sqrt{270}$

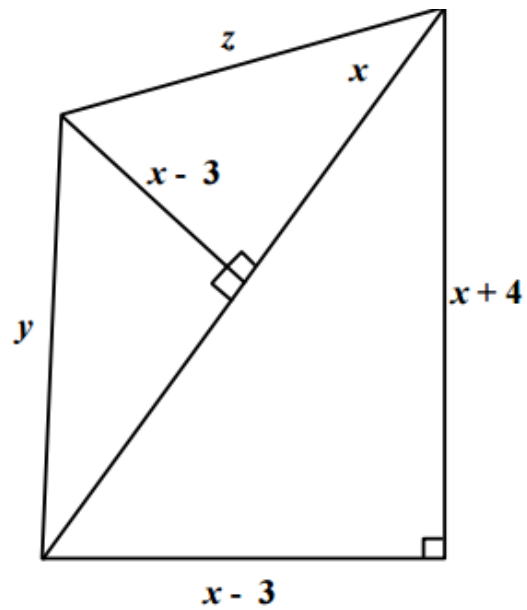
35. In triangle DEF shown below, points A, B and C are taken on DE, DF and EF respectively such that $EC = AC$ and $CF = BC$. If angle D equals 40 degrees, then angle ACB is ?



CAT 2001, Q34

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

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



CAT 2001, Q40

- (A) 10
(C) 12

- (B) 11
(D) None of these

CAT 2000 - Questions 37-39

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

CAT 2000, Q67

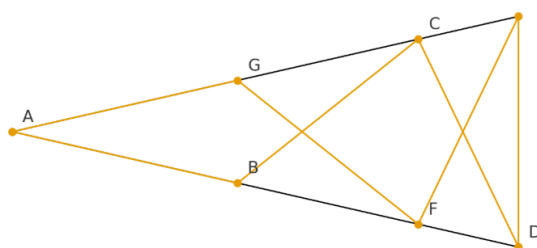
- (A) 6
(B) 5
(C) 4
(D) 3

38. 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

39. 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°

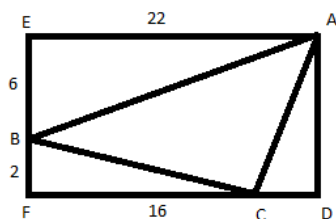
CAT 1997 - Questions 40-41

40. 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

41. 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.

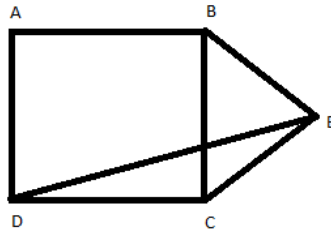


CAT 1997, Q143

- (A) 4
(B) 5
(C) 3.5
(D) None of these

CAT 1996 - Questions 42-43

42. 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°

43. 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

- End of PYQ Collection -