CAT PRACTICE : GEOMETRY - TRIANGLES

The following topics are covered in the CAT quant section from Geometry - Triangles. Detailed explanatory answers, solution videos and slide decks are also provided.

1 TRIANGLES - INTEGER VALUES

x, y, z are integer that are side of an obtuse-angled triangle. If xy = 4, find z.

A. 2
B. 3
C. 1
D. More than one possible value of z exists

Correct answer Explanatory Answer Triangle Properties Hard

2 TRIANGLES - INTEGER VALUES

How many isosceles triangles with integer sides are possible such that sum of two of the side is 12?

A. 11
B. 6
C. 17
D. 23

Correct answer Explanatory Answer Triangle Properties Medium

3 TRIANGLES - AREA

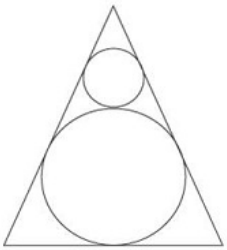
Sides of a triangle are 6, 10 and x for what value of x is the area of the △ the maximum?

A. 8 cms
B. 9 cms
C. 12 cms
D. None of these

Correct answer Explanatory Answer Maximum possible area Hard

4 EQUILATERAL TRIANGLE AND CIRCLE

Two circles are placed in an equilateral triangle as shown in the figure. What is the ratio of the area of the smaller circle to that of the equilateral triangle?



A. $\pi : 36\sqrt{3}$
B. $\pi : 18\sqrt{3}$
C. $\pi : 27\sqrt{3}$
D. $\pi : 42\sqrt{3}$

Correct answer Explanatory Answer Area Properties Hard

5 NUMBER OF TRIANGLES

Perimeter of a △ with integer sides is equal to 15. How many such triangles are possible?

A. 7
B. 6
C. 8
D. 5

Correct answer Explanatory Answer Perimeter - Triangles Medium

6 EQUILATERAL TRIANGLE AND SQUARE

There is an equilateral triangle with a square inscribed inside it. One of the sides of the square lies on a side of the equilateral △. What is the ratio of the area of the square to that of the equilateral triangle?

A. $12 : 12 + 7\sqrt{3}$
B. $24 : 24 + 7\sqrt{3}$
C. $18 : 12 + 15\sqrt{3}$
D. $6 : 6 + 5\sqrt{3}$

Correct answer Explanatory Answer Symmetric figures Hard

7 TRIANGLES - INTEGER VALUES

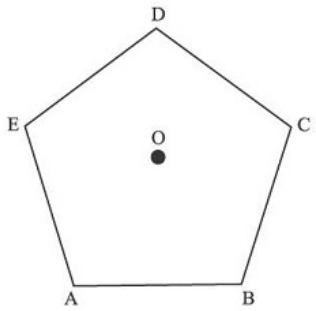
△ABC has integer sides x, y, z such that xz = 12. How many such triangles are possible?

A. 8
B. 6
C. 9
D. 12

Correct answer Explanatory Answer Triangle Properties Medium

8 REGULAR PENTAGON

ABCDE is a regular pentagon. O is a point inside the pentagon such that AOB is an equilateral triangle. What is ∠OEA?



A. 66°
B. 48°
C. 54°
D. 72°

Correct answer Explanatory Answer Polygons Medium

9 TRIANGLE PROPERTIES

△ has sides a^2, b^2 and c^2. Then the triangle with sides a, b, c has to be:-

A. Right-angled
B. Acute-angled
C. Obtuse-angled
D. Can be any of these three

Correct answer Explanatory Answer Acute or Obtuse Medium

10 RIGHT TRIANGLE PROPERTIES

Consider a right–angled triangle with inradius 2 cm and circumradius of 7 cm. What is the area of the triangle?

A. 32 sq cms
B. 31.5 sq cms
C. 32.5 sq cms
D. 33 sq cms

Correct answer Explanatory Answer Inradius and Circumradius Medium

11 DIAGONALS OF OCTAGON

What is the ratio of longest diagonal to the shortest diagonal in a regular octagon?

A. $\sqrt{3}:1$
B. 2 : 1
C. $2:\sqrt{3}$
D. $\sqrt{2}:1$

Correct answer Explanatory Answer Diagonals of octagon Hard

12 ALTITUDE OF TRIANGLE

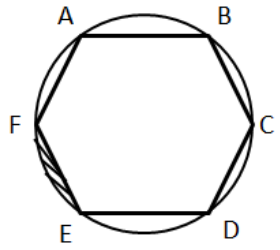
Find the altitude to side AC of triangle with side AB = 20 cm, AC = 20 cm, BC = 30 cm.

A. $10\sqrt{7}$
B. $8\sqrt{7}$
C. $7.5\sqrt{7}$
D. $15\sqrt{7}$

Correct answer Explanatory Answer Altitude of triangle Hard

13 HEXAGON INSCRIBED INSIDE CIRCLE

ABCDEF is a regular hexagon inscribed inside a circle. If the shortest diagonal of the hexagon is of length 3 units, what is the area of the shaded region



A. $1/6(3\Pi - (9\sqrt{3})/2)$
B. $1/6(2\Pi - (6\sqrt{3})/2)$
C. $1/6(3\Pi - (8\sqrt{3})/2)$
D. $1/6(6\Pi - (15\sqrt{3})/2)$

Correct answer Explanatory Answer Hexagon inscribed inside circle Hard

14 CHORDS OF A CIRCLE

A circle of radius 5 cm has chord RS at a distance of 3 units from it. Chord PQ intersects with chord RS at T such that TS = 1/3 of RT. Find minimum value of PQ

A. $6\sqrt{3}$
B. $4\sqrt{3}$
C. $8\sqrt{3}$
D. $2\sqrt{3}$

Correct answer Explanatory Answer Chords of a circle Hard

15 AREA OF THE TRIANGLE

Triangle has perimeter of $6 + 2\sqrt{3}$. One of the angles in the triangle is equal to the exterior angle of a regular hexagon another angle is equal to the exterior angle of a regular 12-sided polygon. Find area of the triangle.

A. $2\sqrt{3}$
B. $\sqrt{3}$
C. $\frac{\sqrt{3}}{2}$
D. 3

Correct answer Explanatory Answer Area of the Triangle Medium

16 RHOMBUS - LENGTH OF THE DIAGONALS

Area of a Rhombus of perimeter 56 cms is 100 sq cms. Find the sum of the lengths of its diagonals.

A. 33.40
B. 34.40
C. 31.20
D. 32.30

Correct answer Explanatory Answer Rhombus - Length of the diagonals Mediur

17 RHOMBUS - AREA

Rhombus has a perimeter of 12 and one angle = 120°. Find its area

A. $9*\frac{\sqrt{3}}{2}$
B. $3*\frac{\sqrt{3}}{2}$
C. $9*\sqrt{3}$
D. $18*\sqrt{3}$

Correct answer Explanatory Answer Rhombus - Area Medium

18 AREA OF AN ISOSCELES TRIANGLE

Circle with center O and radius 25 cms has a chord AB of length of 14 cms in it. Find the area of triangle AOB.

A. 144 cm^2
B. 121 cm^2
C. 156 cm^2
D. 168 cm^2

Correct answer Explanatory Answer Area of an isosceles triangle Medium

19 RADIUS OF CIRCLE

Two mutually perpendicular chords AB and CD intersect at P. AP = 4, PB = 6, CP = 3. Find radius of the circle.

A. $26^{\frac{1}{2}}$
B. $13^{\frac{1}{2}}$
C. $24^{\frac{1}{2}}$
D. $52^{\frac{1}{2}}$

Correct answer Explanatory Answer Radius of Circle Medium

20 TRIANGLE

Triangle ABC has angles A = 60° and B = 70°. The incenter of this triangle is at I. Find angle BIC.

A. 90°
B. 130°
C. 80°
D. 120°

Correct answer Explanatory Answer Triangle Medium

21 AREA OF RHOMBUS

Rhombus of side 6 cm has an angle equal to the external angle of a regular octagon. Find the area of the rhombus.

A. 18 $\sqrt{2}cm^2$
B. 9 $\sqrt{2}cm^2$
C. 15 $\sqrt{2}cm^2$
D. 12 $\sqrt{2}cm^2$

Correct answer Explanatory Answer Area of Rhombus Medium

22 CIRCLE, SQUARE AND TRIANGLE

A circle inscribed in a square of side 2 has an equilateral triangle inscribed inside it. What is the ratio of areas of the equilateral triangle to that of the square?

A. 9 $\sqrt{3}$: 16
B. 3 $\sqrt{3}$: 4
C. 9 $\sqrt{3}$: 4
D. 3 $\sqrt{3}$: 16

Correct answer Explanatory Answer Circle, Square and Triangle Medium

23 ISOSCELES TRIANGLE

An acute-angled isosceles triangle has two of its sides equal to 10 and 16. Find the area of this triangle.

A. $\sqrt{231}$ units
B. $12\sqrt{66}$ units
C. 24 units
D. 5 $\sqrt{231}$ units

Correct answer Explanatory Answer Isosceles Triangle Mediu...

24 **RATIO OF AREAS**

Three equal circles are placed inside an equilateral triangle such that any circle is tangential to two sides of the equilateral triangle and to two other circles. What is the ratio of the areas of one circle to that of the triangle?

A. $\Pi : (6 + 4\sqrt{3})$
B. $3\Pi : (6 + 4\sqrt{3})$
C. $2\Pi : (6 + 4\sqrt{3})$
D. $\Pi : (6 + 2\sqrt{3})$

Correct answer Explanatory Answer Ratio of Areas Medium

25 **RATIO OF AREAS**

There is an equilateral triangle with a square inscribed inside it. One of the sides of the square lies on a side of the equilateral $\triangle$. What is the ratio of the area of the square to that of the equilateral triangle?

A. $\sqrt{3} : (5 + 4\sqrt{3})$
B. $2\sqrt{3} : (7 + 4\sqrt{3})$
C. $4\sqrt{3} : (7 + 4\sqrt{3})$
D. $4\sqrt{3} : (5 + 2\sqrt{3})$

Correct answer Explanatory Answer Ratio of Areas Medium

26 **RATIO OF AREAS**

Consider Square S inscribed in circle C, what is ratio of the areas of S and Q? Consider Circle C inscribed in Square S, what is ratio of the areas of S and Q?

A. $2 : \Pi , 4 : \Pi$
B. $4 : \Pi , 2 : \Pi$
C. $1 : \Pi , 4 : \Pi$
D. $2 : \Pi , 1 : \Pi$

Correct answer Explanatory Answer Ratio of Areas Medium

27 **RATIO OF AREAS**

Consider equilateral triangle T inscribed in circle C, what is ratio of the areas of T and C? Consider Circle C inscribed in equilateral triangle T, what is ratio of the areas of T and C?

A. $3\sqrt{3} : \Pi , 3\sqrt{3} : 16\Pi$
B. $3\sqrt{3} : 4\Pi, 3\sqrt{3} : \Pi$
C. $\sqrt{3} : \Pi , 3\sqrt{3} : 4\Pi$
D. $\sqrt{3} : \Pi , \sqrt{3} : 16\Pi$

Correct answer Explanatory Answer Ratio of Areas Medium

28 **RATIO OF AREAS**

Consider Regular Hexagon H inscribed in circle C, what is ratio of the areas of H and C? Consider Circle C inscribed in Regular Hexagon H, what is ratio of the areas of H and C?

A. $2\sqrt{3} : 3\Pi , 3\sqrt{3} : 4\Pi$
B. $3\sqrt{3} : \Pi , 3\sqrt{3} : 4\Pi$
C. $3\sqrt{3} : 2\Pi, 2\sqrt{3} : \Pi$
D. $\sqrt{3} : \Pi , \sqrt{3} : 4\Pi$

Correct answer Explanatory Answer Ratio of Areas Medium

29 **DISTANCE BETWEEN CIRCUMCENTER AND ORTHOCENTER**

What is the distance between the orthocentre and the circumcenter of a triangle who sides measure 24 cm, 26 cm and 10 cm?

A. 13 cm
B. 12 cm
C. 7.5 cm
D. $\sqrt{30}$ cm

Correct answer Explanatory Answer Distance - ortho and circumcenter Easy

30 **CIRCLES TOUCHING EXTERNALLY**

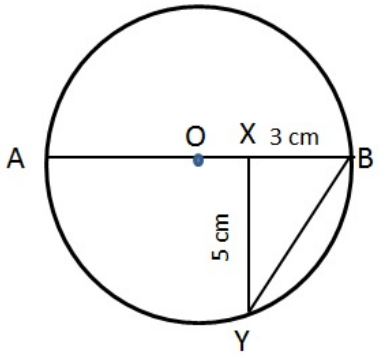
Two circles with centres O_1 and O_2 touch each other externally at a point R. AB is a tangent to both the circles passing through R. P'Q' is another tangent to the circles touching them at P and Q respectively and also cutting AB at S. PQ measures 6 cm and the point S is at distai of 5 cms and 4 cms from the centres of the circles. What is the area of the triangle SO_1O_2?

A. 9 cm^2
B. $3(4 + \sqrt{7})/2$ cm^2
C. 27/2 cm^2
D. $(3\sqrt{41})/2$ cm^2

Correct answer Explanatory Answer Circles touching externally Medium

31 CIRCUMFERENCE OF A CIRCLE

What is the circumference of the below circle given that AB is the diameter and XY is perpendicular to AB?

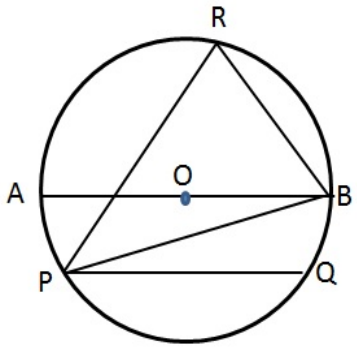


A. 8π cm
B. $\pi \sqrt{34}$ cm
C. 34π/3 cm
D. $\pi \sqrt{31}/3$ cm

Correct answer Explanatory Answer Circumference of a circle Medium

32 DATA SUFFICIENCY

Find ∠PRB. Given
I. ∠BPQ = 22° and O is the centre of the circle
II. ∠RBP = 54° and chord PQ is parallel to AB



A. Either I or II individually is sufficient
B. Both I and II together are required
C. One of the statements alone is sufficient
D. Need more data

Correct answer Explanatory Answer Data Sufficiency Medium

33 SIDE OF A TRIANGLE

The two sides of a triangle are 8 cm and 9 cm and one angle is 60°. Which of the following can be the length of its third side?
I. $\sqrt{23}$ cm
II. $\sqrt{73}$ cm
III. $(4.5 - \sqrt{3.25})$ cm
IV. $(4 + \sqrt{33})$ cm
V. $(9 + \sqrt{13})$ cm

A. Only II and IV
B. Only I and III
C. Only I, II and V
D. Only II, III and IV

Correct answer Explanatory Answer Side of a triangle Medium

34 NUMBER OF PARALLELOGRAMS

There is a set of parallel lines with x lines in it and another set of parallel lines with y lines in it. The lines intersect at 12 points. If x > y, find the maximum number of parallelograms that can be formed.

A. 16
B. 15
C. 18
D. 33

Correct answer Explanatory Answer Number of parallelograms Hard

35 RATIO OF CIRCUMFERENCES

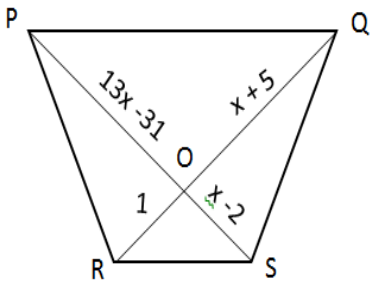
There are 2 concentric circles, one big and one small. A square ABCD is inscribed inside the big circle while the same square circumscribes the small circle. The square touches the small circle at points P, Q, R and S. Determine the ratio of circumference of big circle to the polygon PQRS.

A. $\pi : 2$
B. $2 : \pi$
C. $2 : \sqrt{2}$
D. $\pi : \sqrt{2}$

Correct answer Explanatory Answer Ratio of circumferences Medium

36 QUADRILATERAL BASICS

If PQ∥RS, find the value of x

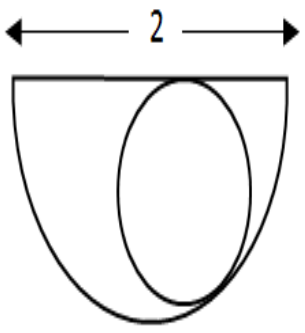


A. 7
B. 3
C. Both A & B
D. None of these

Correct answer Explanatory Answer Quadrilateral Basics Medium

37 INSCRIBED CIRCLES

A circle is inscribed in a semi-circle as shown:-



The radius of the circle is:-

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

Correct answer Explanatory Answer Inscribed Circles Har

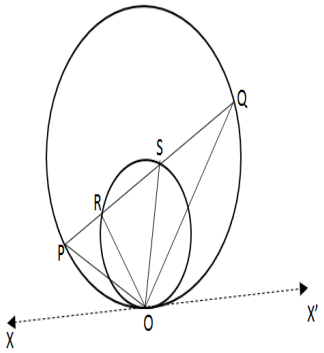
38 CIRCLES

Two circles of radius 5 cm have a direct tangent PQ and an indirect tangent RS. Find the length of PQ if RS = 24 cm.

A. 29 cm
B. 13 cm
C. 26 cm
D. Cannot be determined

Correct answer Explanatory Answer Circles Medium

39 CIRCLES



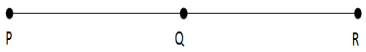
In the above figure which of the following holds good?

A. ∠SQO = ∠ROP
B. 2 ∠ROP = ∠SOR
C. ∠POR = ∠ASO
D. ∠QOX' = ∠SOR + ∠ROP

Correct answer Explanatory Answer Circles Medium

40 BASIC GEOMETRY

In the below figure:-



If $\frac{PQ}{PR} = \frac{PR}{RQ}$, then

A. $\frac{PR}{QR} > 2$
B. $\frac{PR}{QR} = 2$
C. $\frac{PR}{QR} < 2$
D. can't be determined

Correct answer Explanatory Answer Circles Medium

41 BASIC GEOMETRY

A right angled triangle PQR is such that ∠PRQ = 90° and QR = 4 cm T is a point on QR such that PT = 3 cm, and perimeter of triangle PQT = Perimeter of triangle PTR Then, $\frac{QT}{TR} > 2$ takes the value.

A. $\frac{QT}{TR} < \frac{1}{3}$
B. $\frac{1}{3} < \frac{QT}{TR} < 1$
C. $\frac{QT}{TR} > 1$
D. can't be determined

Correct answer Explanatory Answer Trianlges Har

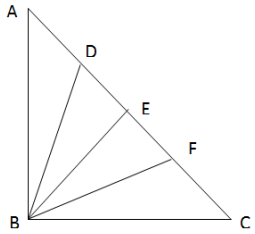
BASIC GEOMETRY

42 M and N are two points on the side PQ and PR of a triangle PQR respectively such that MNQR is a trapezium and MN:QR = 2:5. Find the ratio of the area of triangle PMN : Trapezium MNQR.

A. 4:25
B. 1:2
C. 4:21
D. 4:10

Correct answer Explanatory Answer Triangles, Trapezium Easy

43 BASIC GEOMETRY

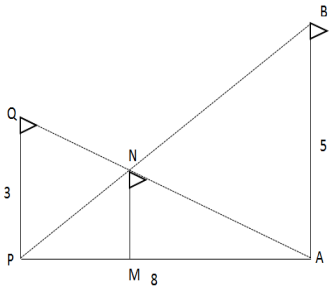


In the above figure, ΔABC is right angled and AC = 100 cm. Also, AD = DE = EF = FC. Find the value of:
$BD^2 + BE^2 + BF^2$ (in cm^2)

A. 10,000
B. 5,000
C. 8,750
D. 12,500

Correct answer Explanatory Answer Triangles Hard

44 BASIC GEOMETRY



The Olympics committee came up with a new rule. The flag of the gold medal winning team would be hoisted to the right (AB) at 5m. The flag of silver medal winning team would be hoisted to the left (PQ) at a height of 3m. The flag (MN) of bronze medal winning team would be hoisted at the point of intersection of the line joining the top of each of AB and PQ to the foot of other, as shown in the figure above. A and P are 8m apart. In a wrestling event, India won the bronze medal. Find the height at which the Indian flag was hoisted.

A. 2 m
B. $\frac{5}{2}$ m
C. $\frac{5}{8}$ m
D. $\frac{15}{8}$ m

Correct answer Explanatory Answer Triangles Hard

45 BASIC GEOMETRY

The number of sides in a regular polygon is 'T' times the number of diagonals in it. What is the interior angle of this polygon in terms of T?

A. $180 * \frac{(T+2)}{(3T+2)}$
B. $540 * \frac{(T+2)}{(3T+2)}$
C. $360 * \frac{(T+2)}{(3T+2)}$
D. $90 * \frac{(T+2)}{(3T+2)}$

Correct answer Explanatory Answer Triangles Medium

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Masks, Masks, Masks ... But Quality

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