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CAT PRACTICE : TRIGONOMETRY

You are here: Home ▶ CAT Questionbank ▶ CAT Quant ▶ **Trigonometry**

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

1 TRIGONOMETRY - SINE AND COSINE

$3\sin x + 4\cos x + r$ is always greater than or equal to 0. What is the smallest value 'r' can take?

- A. 5
- B. -5
- C. 4
- D. 3

Correct answer

Explanatory Answer

Trigonometric Functions

Medium

2 RANGE OF FUNCTION

$\sin^{2014} x + \cos^{2014} x = 1$, x in the range of $[-5\pi, 5\pi]$, how many values can x take?

- A. 0
- B. 10
- C. 21
- D. 11

Correct answer

Explanatory Answer

Sine and Cosine



Medium

3 HEIGHT AND DISTANCES

Consider a regular hexagon ABCDEF. There are towers placed at B and D. The angle of elevation from A to the tower at B is 30 degrees, and to the top of the tower at D is 45 degrees. What is the ratio of the heights of towers at B and D?

- A. $1 : \sqrt{3}$
- B. $1 : 2\sqrt{3}$
- C. $1 : 2$
- D. $3 : 4\sqrt{3}$

Correct answer

Explanatory Answer

Maximum and Minimum Value



Medium

4 MAXIMUM AND MINIMUM VALUE

Find the maximum and minimum value of $8 \cos A + 15 \sin A + 15$

- A. $11\sqrt{2}+15$; 15
- B. 30; 8
- C. 32; -2
- D. 23; 8

Correct answer

Explanatory Answer

Maximum and Minimum Value

Hard

5 TRIGONOMETRIC IDENTITIES

If $\cos A + \cos^2 A = 1$ and $a \sin^{12} A + b \sin^{10} A + c \sin^8 A + d \sin^6 A - 1 = 0$. Find the value of $a + \frac{b}{c} + d$

- A. 4
- B. 3
- C. 6
- D. 1

Correct answer

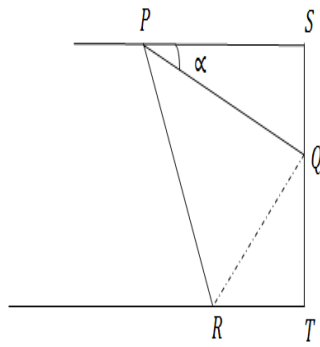
Explanatory Answer

Trigonometric Identities



Medium

6 TRIGONOMETRIC IDENTITIES



In the above figure, the sheet of width W is folded along PQ such that R overlaps S . Length of PQ can be written as :-

- A. $\frac{W}{\sin\alpha(1+\cos2\alpha)}$
- B. $\frac{W}{\sin2\alpha\cos\alpha}$
- C. $\frac{W}{\cos\alpha(1+\sin2\alpha)}$
- D. Any two of the above

Correct answer Explanatory Answer Trigonometric Identities

Hard

7 TRIGONOMETRY AND LOGARITHM

Find the value of :- $(\log \sin 1^\circ + \log \sin 2^\circ + \dots + \log \sin 89^\circ) + (\log \tan 1^\circ + \log \tan 2^\circ + \dots + \log \tan 89^\circ) - (\log \cos 1^\circ + \log \cos 2^\circ + \dots + \log \cos 89^\circ)$

- A. $\log \sqrt{2}/(1+\sqrt{2})$
- B. -1
- C. 1
- D. none of these

Correct answer Explanatory Answer Trigonometry and Logarithm

Hard

8 HEIGHT AND DISTANCES

Ram and Shyam are 10 km apart. They both see a hot air balloon passing in the sky making an angle of 60° and 30° respectively. What is the height at which the balloon could be flying?

- A. $\frac{5}{2}\sqrt{3}$
- B. $5\sqrt{3}$
- C. Both A and B
- D. Can't be determined

Correct answer Explanatory Answer Height and Distances

Hard

9 HEIGHT AND DISTANCES

A man standing on top of a tower sees a car coming towards the tower. If it takes 20 minutes for the angle of depression to change from 30° to 60° , what is the time remaining for the car to reach the tower?

- A. $20\sqrt{3}$ minutes
- B. 10 minutes
- C. $10\sqrt{3}$ minutes
- D. 5 minutes

Correct answer Explanatory Answer Height and Distances

Medium

10 RIGHT TRIANGLE

A right angled triangle has a height 'p', base 'b' and hypotenuse 'h'. Which of the following value can h^2 not take, given that p and b are positive integers?

- A. 74
- B. 52
- C. 13
- D. 23

Correct answer Explanatory Answer Right Triangle

Medium

11 TRIGONOMETRIC IDENTITIES

If $\tan\phi + \sin\phi = m$, $\tan\phi - \sin\phi = n$, Find the value of $m^2 - n^2$

- A. $2\sqrt{mn}$
- B. $4\sqrt{mn}$
- C. $m - n$

D. 2mn

Correct answer Explanatory Answer Trigonometric Identities

Hard

12 HEIGHTS AND DISTANCES

A student is standing with a banner at the top of a 100 m high college building. From a point on the ground, the angle of elevation of the top of the student is 60° and from the same point, the angle of elevation of the top of the tower is 45° . Find the height of the student.

- A. 35 m
- B. 73.2 m
- C. 50 m
- D. 75 m

Correct answer Explanatory Answer Heights and Distances

Medium

13 TRIGONOMETRIC IDENTITIES

If $\cos x - \sin x = \sqrt{2} \sin x$, find the value of $\cos x + \sin x$:

- A. $\sqrt{2} \cos x$
- B. $\sqrt{2} \operatorname{cosec} x$
- C. $\sqrt{2} \sec x$
- D. $\sqrt{2} \sin x \cos x$

Correct answer Explanatory Answer Trigonometric Identities

Medium

14 TRIGONOMETRIC IDENTITIES

If $\frac{(2\sin x)}{(1+\cos x+\sin x)} = t$, $\frac{(1-\cos x+\sin x)}{(1+\sin x)}$ can be written as:

- A. $\frac{1}{t}$
- B. t
- C. \sqrt{t}
- D. $\frac{t}{\sin x}$

Correct answer Explanatory Answer Trigonometric Identities

Medium

15 HEIGHT OF A TREE

A tall tree AB and a building CD are standing opposite to each other. A portion of the tree breaks off and falls on top of the building making an angle of 30° . After a while it falls again to the ground in front of the building, 4 m away from foot of the tree, making an angle of 45° . The height of the building is 6 m. Find the total height of the tree in meters before it broke.

- A. $27\sqrt{3} + 39$
- B. $12\sqrt{3} + 10$
- C. $15\sqrt{3} + 21$
- D. Insufficient Data

Correct answer Explanatory Answer Height of a tree

Hard

16 HEIGHT OF A FLAG POLE

A flag is hoisted on top of a building of height $7\sqrt{3}$ m. A man of height $\sqrt{3}$ m, standing on the ground, sees the top and bottom of the flag pole at 2 different angles of elevation that are found to be complementary. If the man is standing $\sqrt{135}$ m away from the building, find the height of the flag pole.

- A. $3\sqrt{3}$ m
- B. $1.5\sqrt{3}$ m
- C. $2/\sqrt{3}$ m
- D. $6/\sqrt{3}$ m

Correct answer Explanatory Answer Height of a flag pole

Hard

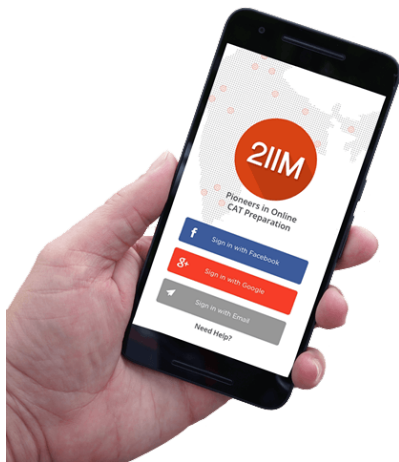
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Jan 11, 2018 12:30 PM

CAT 17: General thoughts (Attempts, Percentiles, etc)

Hope you all had a good go at CAT 17. In the immediate aftermath of the exam, it is inevitable that the mind will think about the potential score.

Nov 29, 2017 12:05 PM

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CAT PREP: QUANTS

on questions on partial fractions, on how to simplify them and how to solve questions that involve a summation of a series of fraction...

Nov 23, 2016 11:06 AM

CAT Online Coaching – Ordered and Unordered Pairs

What is the difference between ordered and unordered pairs? This is

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