



### Question C

If  $\sin A = \frac{4}{5}$ , then find the value of  $(2 + \tan A)(4 + \cos A)$ .

$\sin A = \frac{4}{5}$  எனில்,  $(2 + \tan A)(4 + \cos A)$ -இன் மதிப்பைக் காண்க.

A)  $\frac{15}{46}$

B)  $\frac{46}{15}$

C)  $\frac{208}{15}$

D)  $\frac{15}{208}$

$$\sin^2 A + \cos^2 A = 1$$

$$\left(\frac{4}{5}\right)^2 + \cos^2 A = 1$$

$$\cos^2 A = 1 - \frac{16}{25}$$

$$\cos^2 A = \frac{25-16}{25}$$

$$\cos A = \sqrt{\frac{9}{25}}$$

$$\cos A = \frac{3}{5}$$

$$\begin{aligned} \tan A &= \frac{\sin A}{\cos A} \\ &= \frac{4/5}{3/5} \end{aligned}$$

$$\tan A = \frac{4}{3}$$

$$(2 + \tan A)(4 + \cos A) = \left(2 + \frac{4}{3}\right)\left(4 + \frac{3}{5}\right) = \frac{10}{3} \times \frac{23}{5} = \frac{46}{3}$$

**Correct Ans: C**



### Question A

Find the value of  $\frac{\cos 35^\circ}{\sin 55^\circ} + \frac{\sin 11^\circ}{\cos 79^\circ} - 2 \cos 27^\circ \csc 63^\circ$ .

$\frac{\cos 35^\circ}{\sin 55^\circ} + \frac{\sin 11^\circ}{\cos 79^\circ} - 2 \cos 27^\circ \csc 63^\circ$  இன் மதிப்பைக் காண்க.

- ✓ A) 0
- B) 1
- C) -1
- D) 2

$$\frac{\cos 35^\circ}{\sin 55^\circ} + \frac{\sin 11^\circ}{\cos 79^\circ} - 2 \sin 63^\circ \times \frac{1}{\sin 63^\circ}$$

$$1 + 1 - 2(1)$$

$$2 - 2 = 0$$

$$\sin(90 - 35) = \cos 35^\circ$$

$$\sin(90 - \theta) = \cos \theta$$

$$\cos(90 - \theta) = \sin \theta$$

$$\csc \theta = \frac{1}{\sin \theta}$$



**Correct Ans: A**



**Topic: Trigonometry**

24/06/2025 Shift-3

**Question A**

If  $\sin A = \frac{3}{4}$ , then calculate  $\frac{2 \cos A}{\sqrt{7}}$ .

$\sin A = \frac{3}{4}$  எனில்,  $\frac{2 \cos A}{\sqrt{7}}$  ஐக் கணக்கிடுக.

- A)  $\frac{1}{2}$
- B)  $\frac{\sqrt{7}}{2}$
- C)  $\frac{\sqrt{7}}{4}$
- D)  $\frac{1}{4}$

$$\frac{2 \cos A}{\sqrt{7}} = \frac{2}{\sqrt{7}} \times \frac{\sqrt{7}}{4} = \frac{1}{2}$$

$$\sin^2 A + \cos^2 A = 1$$

$$\left(\frac{3}{4}\right)^2 + \cos^2 A = 1$$

$$\cos^2 A = 1 - \frac{9}{16}$$

$$\cos^2 A = \frac{16-9}{16}$$

$$\cos A = \sqrt{\frac{7}{16}}$$

$$\cos A = \frac{\sqrt{7}}{4}$$

**Correct Ans: A**



Topic: Trigonometry

21/06/2025 Shift-2

$$\sec^2 \theta - \tan^2 \theta = 1$$

$$\sec^2 \theta - \left(\frac{4}{3}\right)^2 = 1$$

$$\sec^2 \theta = 1 + \frac{16}{9} = \frac{25}{9}$$

$$\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$$

$$\operatorname{cosec}^2 \theta - \left(\frac{3}{4}\right)^2 = 1$$

$$\operatorname{cosec}^2 \theta = 1 + \frac{9}{16}$$

Question B

If  $3 \tan A = 4$ , then find the value of  $\frac{(1-\sec A)(1+\sec A)}{(1-\csc A)(1+\csc A)}$ .

$3 \tan A = 4$  எனில்,  $\frac{(1-\sec A)(1+\sec A)}{(1-\csc A)(1+\csc A)}$  இன் மதிப்பைக் காண்க.

$$\frac{(a-b)(a+b) = a^2 - b^2}{(1-\sec A)(1+\sec A)} \\ \frac{(1-\operatorname{cosec} A)(1+\operatorname{cosec} A)}$$

A)  $\frac{64}{9}$

B)  $\frac{256}{81}$

C)  $\frac{80}{27}$

D)  $\frac{16}{9}$

$$= \frac{1 - \sec^2 A}{1 - \operatorname{cosec}^2 A} = \frac{1 - \frac{25}{9}}{1 - \frac{25}{16}}$$

$$= \frac{\frac{9-25}{9}}{\frac{16-25}{16}}$$

$$= \frac{-\frac{16}{9}}{-\frac{9}{16}} = +\frac{16}{9} \times \frac{16}{9} = \frac{256}{81}$$

$$\boxed{3 \tan A = 4} \\ \boxed{\tan A = \frac{4}{3}}$$

$$= \frac{25}{16}$$

$$\tan A = \frac{1}{\cot A}$$

$$\cot A = \frac{1}{4/3}$$

$$\boxed{\cot A = \frac{3}{4}}$$

Correct Ans: B



### Question A

If  $\tan \theta = \frac{7}{8}$ , then evaluate  $\frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)(\cot \theta)}$ .

$\tan \theta = \frac{7}{8}$  எனில்,  $\frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)(\cot \theta)}$  ஐ மதிப்பிடுக.

- A)  $\frac{8}{7}$
- B)  $\frac{7}{8}$
- C)  $\frac{49}{64}$
- D)  $\frac{64}{49}$

$\sqrt{\cot \theta} = \frac{\cos \theta}{\sin \theta}$

$$\frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)(\cot \theta)} = \frac{1 - \sin^2 \theta}{(1 - \cos^2 \theta) \cot \theta}$$

$\checkmark \sin^2 \theta + \cos^2 \theta = 1$

$\checkmark \cos^2 \theta = 1 - \sin^2 \theta$

$\checkmark \sin^2 \theta = 1 - \cos^2 \theta$

$$= \frac{\cos^2 \theta}{\sin^2 \theta \cdot \cot \theta}$$
$$= \frac{\cos^2 \theta}{\sin^2 \theta \cdot \frac{\cos \theta}{\sin \theta}}$$
$$= \frac{\cos \theta}{\sin \theta}$$
$$= \cot \theta \rightarrow$$
$$= \frac{1}{\tan \theta}$$
$$= \frac{1}{\frac{7}{8}}$$
$$= \frac{8}{7}$$

**Correct Ans: A**



### Question B



If  $\sin 5A = \cos(A - 42^\circ)$ , where  $5A$  is an acute angle, find the value of  $A$ .

$\sin 5A = \cos(A - 42^\circ)$ , இங்கு  $5A$  ஒரு குறுங்கோணம் எனில்,  $A$  இன் மதிப்பைக் காண்க.

- A)  $21^\circ$
- B)  $22^\circ$
- C)  $20^\circ$
- D)  $23^\circ$

$$\sin 5A = \cos(A - 42^\circ)$$

$$\sin 5A = \sin(90 - (A - 42^\circ))$$

$$5A = 90 - A + 42$$

$$6A = 132$$

$$A = \frac{132}{6} = 22^\circ$$

$$\boxed{A = 22^\circ}$$

**Correct Ans: B**

**Question B**

Simplify:  $\sqrt{\frac{1+\sin A}{1-\sin A}} + \sqrt{\frac{1-\sin A}{1+\sin A}}$

சுருக்குக:  $\sqrt{\frac{1+\sin A}{1-\sin A}} + \sqrt{\frac{1-\sin A}{1+\sin A}}$

$\sin^2 A + \cos^2 A = 1$

$\cos^2 A = 1 - \sin^2 A$

A)  $2 \cos A$

B)  $2 \sec A$

C)  $2 \csc A$

D)  $2 \sin A$

$\sec A = \frac{1}{\cos A}$

$$\sqrt{\frac{1+\sin A}{1-\sin A}} + \sqrt{\frac{1-\sin A}{1+\sin A}}$$

$$= \sqrt{\frac{1+\sin A}{1-\sin A} \times \frac{1+\sin A}{1+\sin A}} + \sqrt{\frac{1-\sin A}{1+\sin A} \times \frac{1-\sin A}{1-\sin A}}$$

$$= \sqrt{\frac{(1+\sin A)^2}{1-\sin^2 A}} + \sqrt{\frac{(1-\sin A)^2}{1-\sin^2 A}}$$

$$= \sqrt{\frac{(1+\sin A)^2}{\cos^2 A}} + \sqrt{\frac{(1-\sin A)^2}{\cos^2 A}}$$

$$= \frac{1+\sin A}{\cos A} + \frac{1-\sin A}{\cos A}$$

$$= \frac{1+\sin A + 1 - \sin A}{\cos A} = \frac{2}{\cos A} = 2 \times \frac{1}{\cos A} = 2 \sec A$$

**Correct Ans: B**

**Question A**

The value of  $3 + \tan^2 \phi + \cot^2 \phi - \sec^2 \phi \csc^2 \phi$  is:

$3 + \tan^2 \phi + \cot^2 \phi - \sec^2 \phi \csc^2 \phi$  இன் மதிப்பு:

- A) 1
- B) 2
- C) -1
- D) 0

$3 + \sec^2 \theta - 1 + \operatorname{cosec}^2 \theta - 1 - \sec^2 \theta \operatorname{cosec}^2 \theta$

$3 - 2 + \sec^2 \theta + \operatorname{cosec}^2 \theta - \sec^2 \theta \operatorname{cosec}^2 \theta$

$1 + \sec^2 45^\circ + \operatorname{cosec}^2 45^\circ - \sec^2 45^\circ \operatorname{cosec}^2 45^\circ$

$1 + (\sqrt{2})^2 + (\sqrt{2})^2 - (\sqrt{2})^2 (\sqrt{2})^2$

$1 + 2 + 2 - 2 \times 2$

$1 + 4 - 4$

$1$

$\sec^2 \theta - \tan^2 \theta = 1$

$\sec^2 \theta - 1 = \tan^2 \theta$  ✓

$\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$

$\operatorname{cosec}^2 \theta - 1 = \cot^2 \theta$  ✓

$\theta = 45^\circ$

**Correct Ans: A**

**Question A**

If  $\sec \theta + \tan \theta = 2$ , then what is the value of  $3 \sec \theta + 4$ ?

$\sec \theta + \tan \theta = 2$  எனில்,  $3 \sec \theta + 4$  இன் மதிப்பு என்ன?

$\sec \theta + \tan \theta = 2 \rightarrow (1)$

$a^2 - b^2$   
 $\sec^2 \theta - \tan^2 \theta = 1$

$(\sec \theta - \tan \theta)(\sec \theta + \tan \theta) = 1$

A)  $\frac{31}{4}$

B)  $\frac{15}{4}$

C)  $\frac{17}{4}$

D)  $\frac{33}{4}$

$\sec \theta - \tan \theta \times 2 = 1$

$\sec \theta - \tan \theta = \frac{1}{2} \rightarrow (2)$

Solve (1) + (2)

~~$\sec \theta + \tan \theta = 2$~~

~~$\sec \theta - \tan \theta = \frac{1}{2}$~~

$2 \sec \theta = 2 + \frac{1}{2}$

$2 \sec \theta = \frac{5}{2} \Rightarrow \boxed{\sec \theta = \frac{5}{4}}$

$3 \sec \theta + 4 = 3 \times \frac{5}{4} + 4 = \frac{15}{4} + 4$

$= \frac{15+16}{4} = \frac{31}{4}$

**Correct Ans: A**



Topic: Trigonometry

06/06/2025 Shift-3

5 AM  
Height + Distance

### Question A

If  $\cot \theta = \frac{3}{4}$ , then find the value of  $\sin \theta$ .

$\cot \theta = \frac{3}{4}$  எனில்,  $\sin \theta$  இன் மதிப்பைக் காண்க.

- A)  $\frac{44}{125}$   
B)  $\frac{117}{125}$   
C)  $\frac{81}{125}$   
D)  $-\frac{117}{125}$

$\frac{4}{5}$

$$\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$$

$$\operatorname{cosec}^2 \theta - \left(\frac{3}{4}\right)^2 = 1$$

$$\operatorname{cosec}^2 \theta = 1 + \frac{9}{16}$$

$$\operatorname{cosec}^2 \theta = \frac{25}{16}$$

$$\operatorname{cosec} \theta = \sqrt{\frac{25}{16}}$$

$$\operatorname{cosec} \theta = \frac{5}{4}$$

$$\begin{aligned} \sin \theta &= \frac{1}{\operatorname{cosec} \theta} \\ &= \frac{1}{5/4} \end{aligned}$$

$$\sin \theta = \frac{4}{5}$$

**Correct Ans: A**