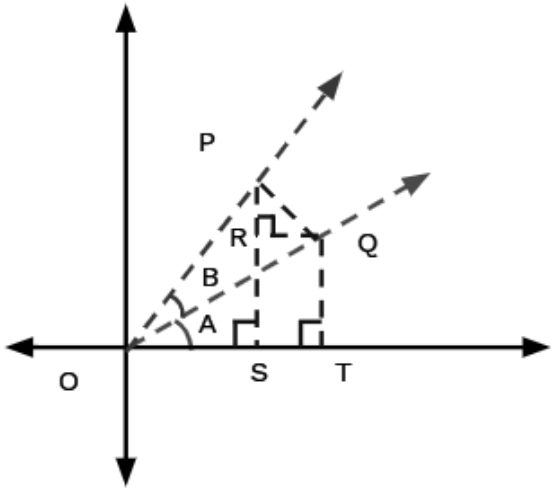
jee LIVE daily 3.0

Compound Angles -2

Trigonometry 6

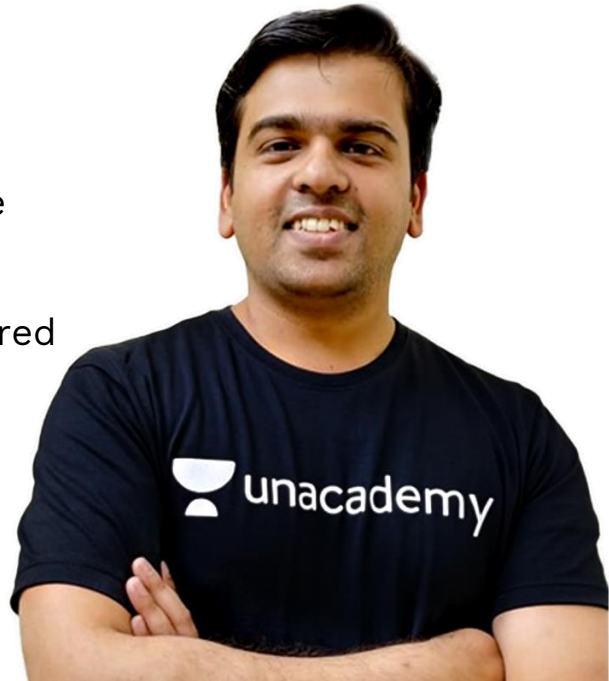


jee LIVE daily 3.0

Sameer Chincholikar

B.Tech, M.Tech - IIT-Roorkee

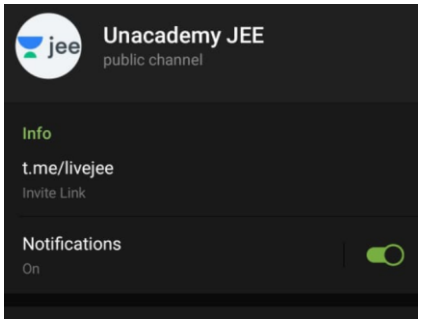
- **10+** years Teaching experience
- Taught **1 Million+** Students
- **100+** Aspiring Teachers Mentored

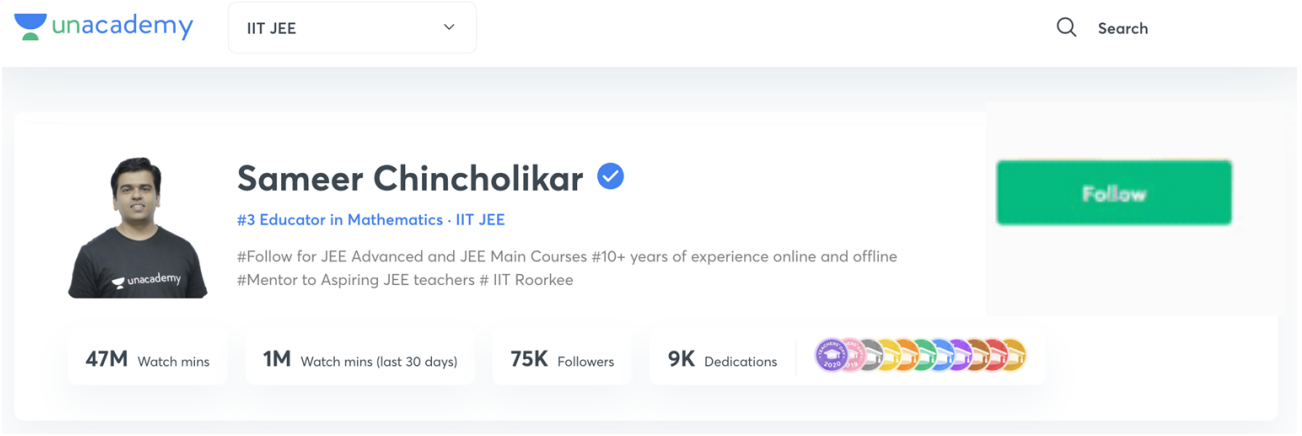


sameer_iitr

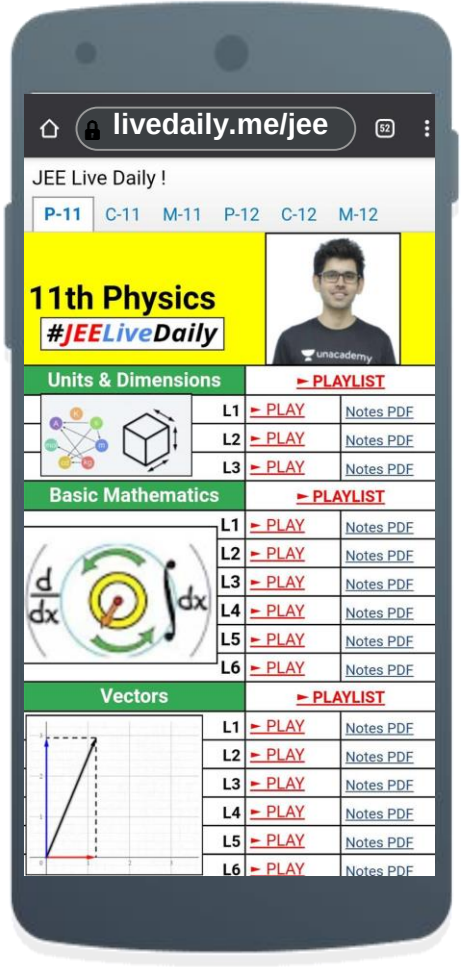
#JEE Live Daily

Telegram Channel

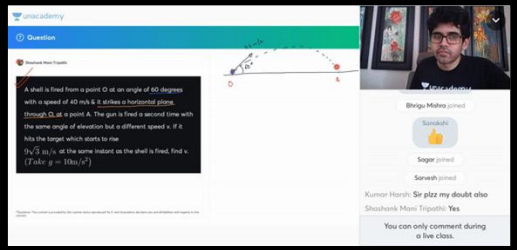


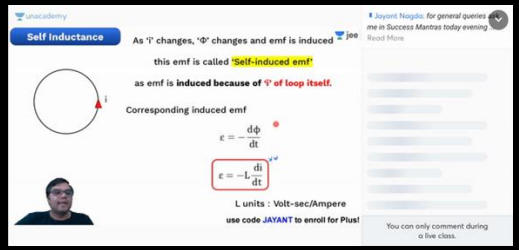


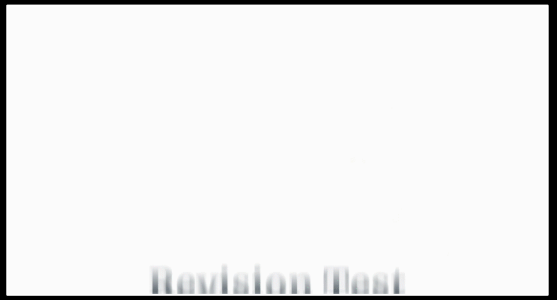
livedaily.me/jee

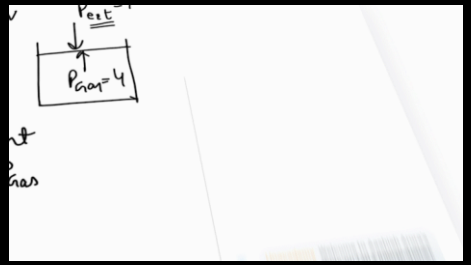


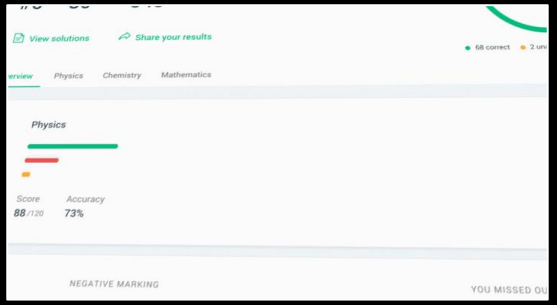
Unacademy Subscription











+ LIVE Class Environment

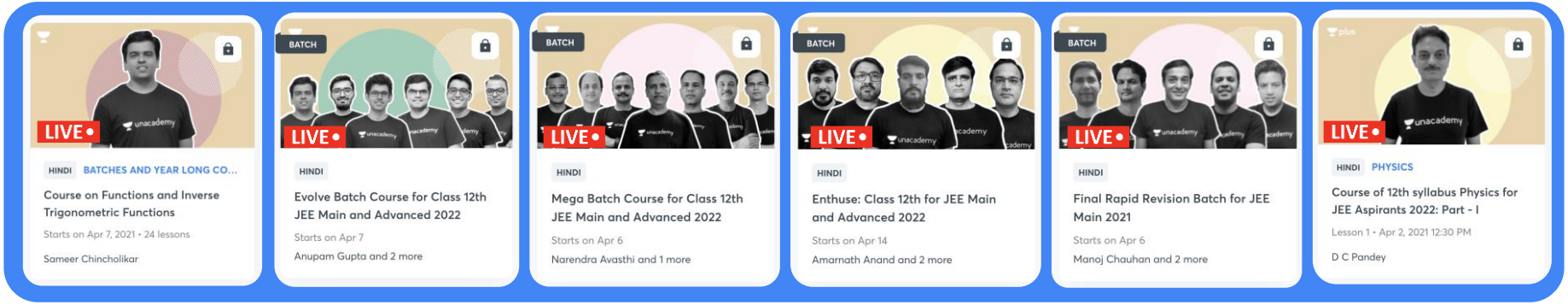
- + **LIVE Polls** & **Leaderboard**
- + **LIVE Doubt** Solving
- + **LIVE** Interaction

+ Performance Analysis

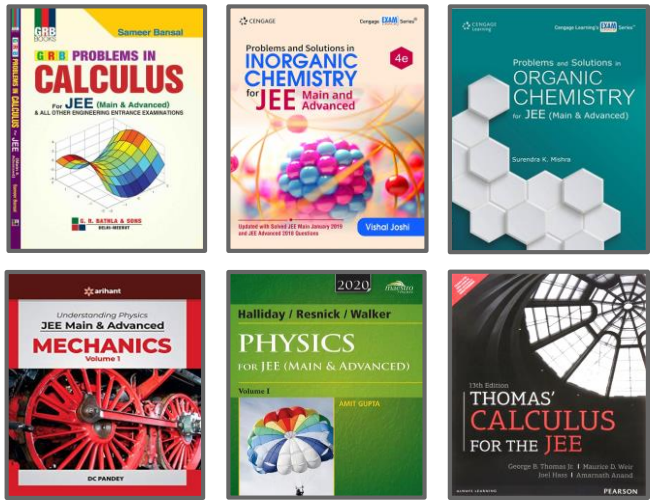
- + **Weekly Test Series**
- + **DPPs** & **Quizzes**

India's **BEST** Educators

Unacademy Subscription



If you want to be the **BEST**
"Learn" from the **BEST**



jee

Top Results

Bratin Mondal

100 %ile

Amaiya Singhal
99.97

Adnan
99.95

Ashwin Prasanth
99.94

Tanmay Jain
99.86

Kunal Lalwani
99.81

Utsav Dhanuka
99.75

Aravindan K Sundaram
99.69

Manas Pandey
99.69

Mihir Agarwal
99.63

Akshat Tiwari
99.60

Sarthak Kalankar
99.59

Vaishnovi Arun
99.58

Devashish Tripathi
99.52

Maroof
99.50

Tarun Gupta
99.50

Siddharth Kaushik
99.48

Mihir Kothari
99.39

Sahil
99.38

Vaibhav Dhanuka
99.34

Pratham Kadam
99.29

Shivam Gupta
99.46

Shrish
99.28

Yash Bhaskar
99.10

Subhash Patel
99.02

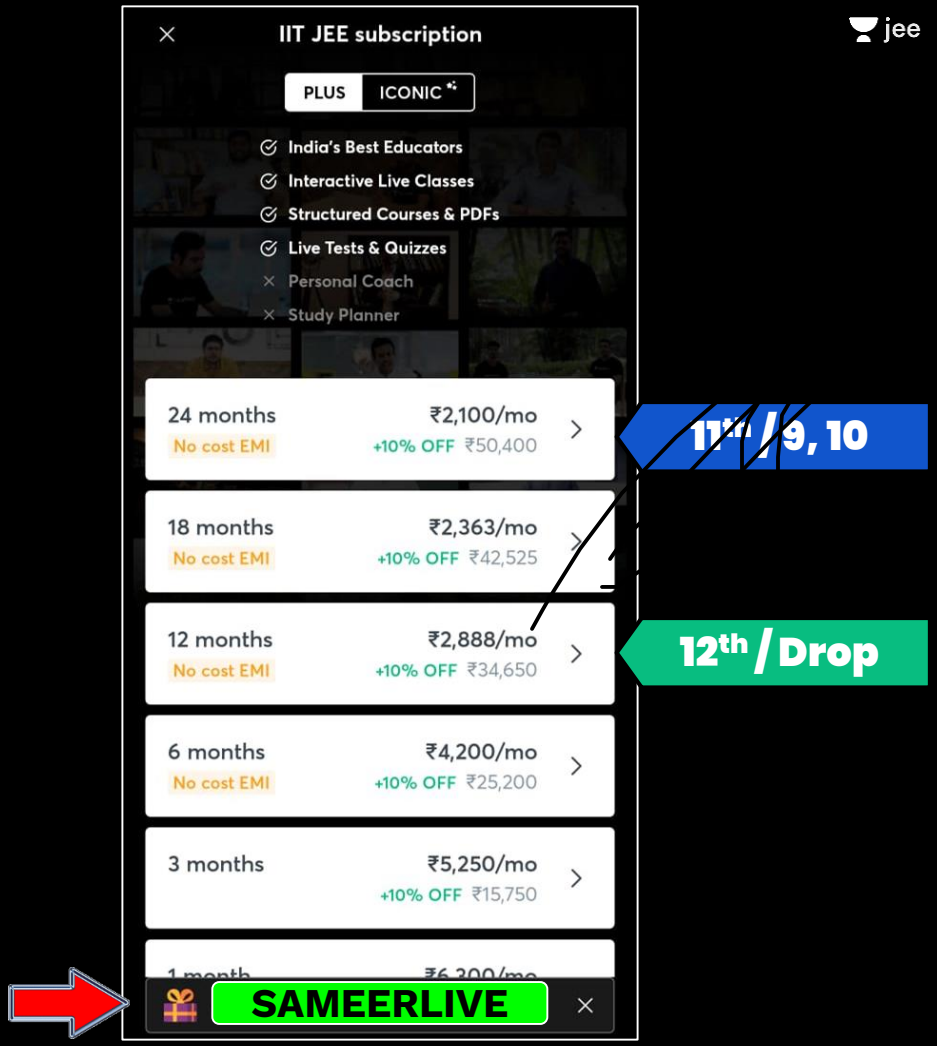
Ayush Kale
98.85

Ayush Gupta
98.67

Megh Gupta
98.59

Naman Goyal
98.48

MIHIR PRAJAPATI
98.16

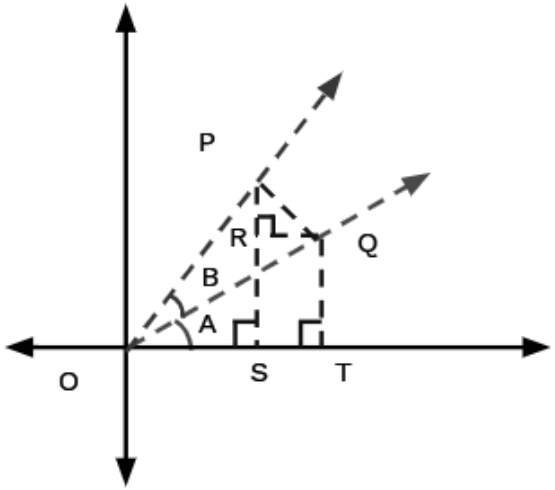

IIT JEE subscription
PLUS
ICONIC
India's Best Educators
Interactive Live Classes
Structured Courses & PDFs
Live Tests & Quizzes
Personal Coach
Study Planner
24 months
No cost EMI
₹2,100/mo
+10% OFF ₹50,400
18 months
No cost EMI
₹2,363/mo
+10% OFF ₹42,525
12 months
No cost EMI
₹2,888/mo
+10% OFF ₹34,650
6 months
No cost EMI
₹4,200/mo
+10% OFF ₹25,200
3 months
₹5,250/mo
+10% OFF ₹15,750
SAMEERLIVE
jee
11th / 9, 10
12th / Drop

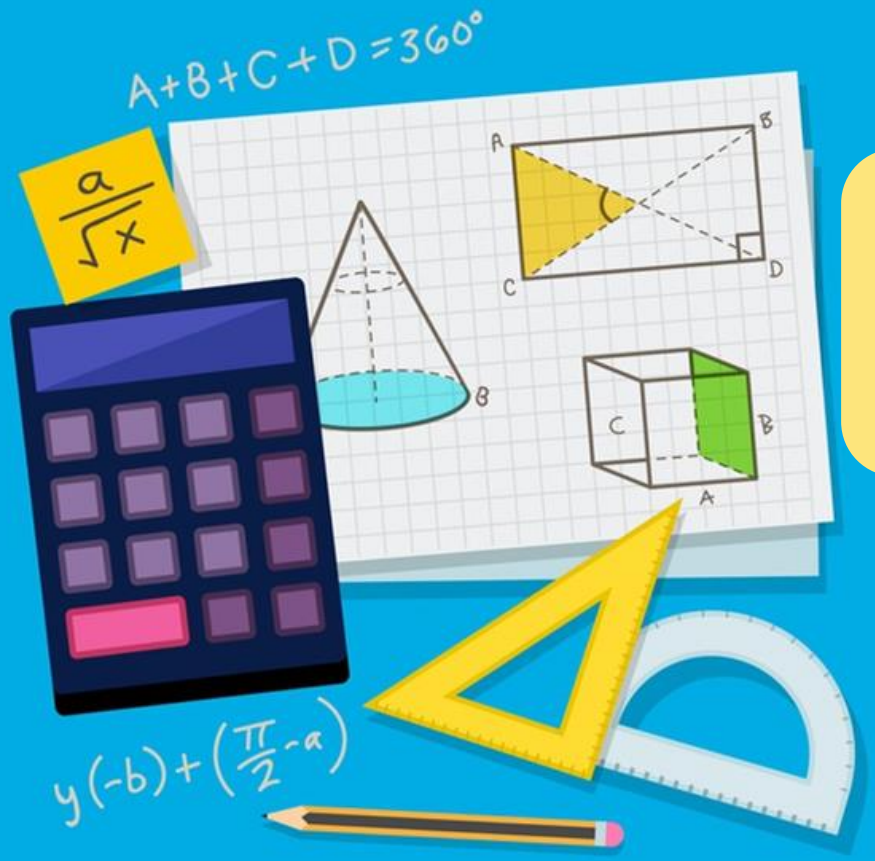
LET'S BEGIN!!

jee LIVE daily 3.0

Compound Angles – 2

Trigonometry 6





Homework Question

In a triangle ABC, angle A is an obtuse angle such

$$\sin A = \frac{3}{5} \text{ and } \sin B = \frac{5}{13} \text{ then } \sin C =$$

$$(A+B)+C = \pi$$

$$C = \pi - (A+B)$$

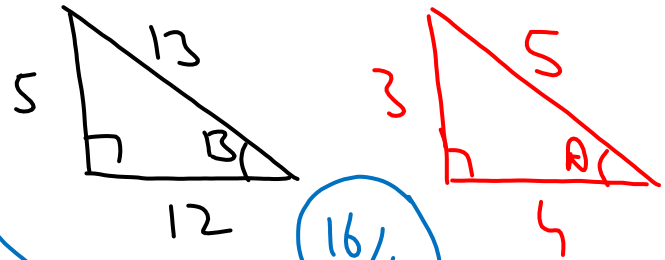
$$\sin C = \sin(\pi - (A+B))$$

$$= \sin(A+B)$$

$$\sin(A+B)$$

$$= \sin A \cos B + \cos A \sin B$$

$$\left(\frac{3}{5}\right)\left(\frac{12}{13}\right) + \left(\frac{-4}{5}\right)\left(\frac{5}{13}\right)$$



$$\frac{16}{65}$$

$$\boxed{\sin^2 A + \cos^2 A = 1}$$

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

$$\cos^2 A = 1 - \frac{9}{25}$$

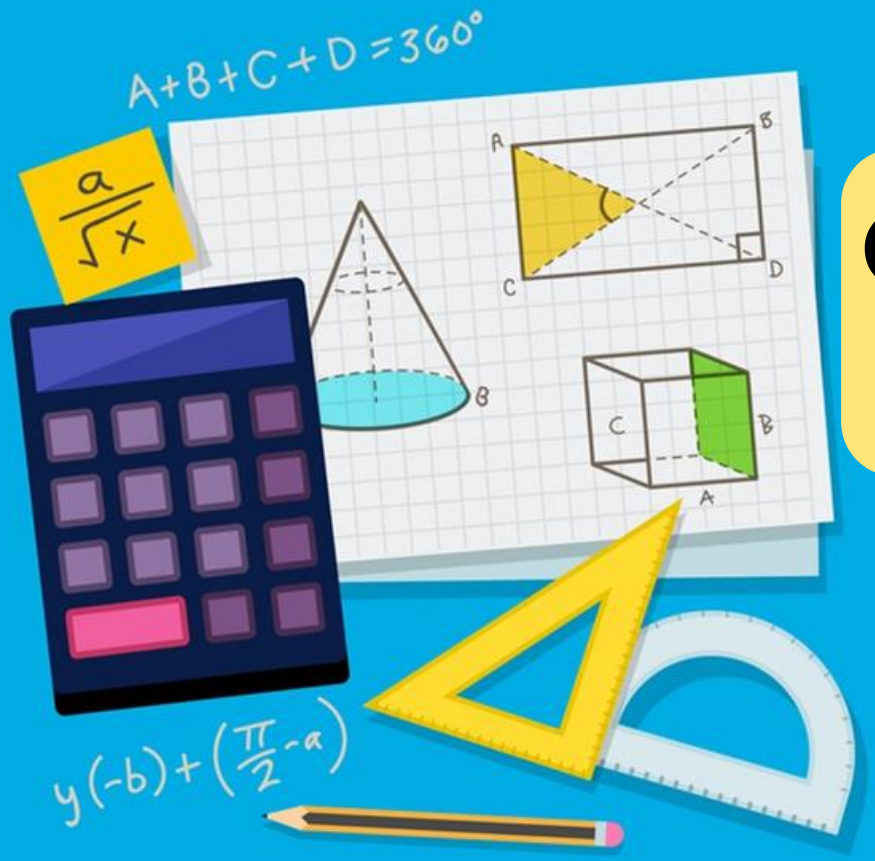
$$\cos^2 A = \frac{16}{25}$$

$$\cos A = \pm \frac{4}{5}$$

A is obtuse

$\Rightarrow$ 2nd Quad

$\Rightarrow \cos A \longrightarrow$ (-ve)



Compound Angles (contd..)

$(1 + \tan\alpha \tan\beta)^2 + (\tan\alpha - \tan\beta)^2$ is equal to

A. $\tan^2\alpha + \tan^2\beta$

B. $\cos^2\alpha \cos^2\beta$

C. $\sec^2\alpha \sec^2\beta$ ✓

D. $\tan^2\alpha \tan^2\beta$

$$\left(1 + \frac{\sin\alpha \sin\beta}{\cos\alpha \cos\beta}\right)^2 + \left(\frac{\sin\alpha}{\cos\alpha} - \frac{\sin\beta}{\cos\beta}\right)^2$$

$$\frac{(\cos(\alpha-\beta))^2}{(\cos\alpha\cos\beta)^2} + \frac{(\sin(\alpha-\beta))^2}{(\cos\alpha\cos\beta)^2}$$

$$\frac{\cos^2(\alpha-\beta)+\sin^2(\alpha-\beta)}{\cos^2\alpha\,\cos^2\beta}$$

$$= \frac{1}{\cos^2\alpha\,\cos^2\beta}$$

If $\tan x \tan y = a$ and $x + y = \pi/6$, then $\tan x$ and $\tan y$ satisfy the equation

A. $t^2 - \sqrt{3}(1 - a)t + a = 0$

B. $\sqrt{3}t^2 - (1 - a)t + a\sqrt{3} = 0$

C. $t^2 + \sqrt{3}(1 + a)t - a = 0$

D. $\sqrt{3}t^2 - (1 + a)t - a\sqrt{3} = 0$

$\tan x \cdot \tan y = a$

And:

$x + y = \frac{\pi}{6}$

$\tan(x+y) = \tan\frac{\pi}{6}$

$\frac{\tan x + \tan y}{1 - \tan x \tan y} = \frac{1}{\sqrt{3}}$

$\tan x + \tan y = \frac{1-a}{\sqrt{3}}$

$$(\alpha, \beta) : x^2 - (\alpha+\beta)x + \alpha\beta = 0$$

$$(\tan x, \tan y) : t^2 - (\tan x + \tan y)t + \tan x \cdot \tan y = 0$$

$$t^2 - \left(\frac{1-a}{\sqrt{3}}\right)t + a = 0$$

JEE Adv. 2009

For $0 < \theta < \frac{\pi}{2}$, the solution (s) of is (are)

$$\sum_{m=1}^{6} \operatorname{cosec}\left(\theta + \frac{(m-1)\pi}{4}\right) \operatorname{cosec}\left(\theta + \frac{m\pi}{4}\right) = 4\sqrt{2}$$

A. $\frac{\pi}{4}$

B. $\frac{\pi}{6}$

C. $\frac{\pi}{12}$

D. $\frac{5\pi}{12}$

$\left(\theta + \frac{m\pi}{4} - \frac{\pi}{4}\right)$ $\quad$ $\theta + \frac{m\pi}{4}$

α $\quad$ $\left(\alpha + \frac{\pi}{4}\right)$

$$\sum \frac{1/\sqrt{2}}{\sin(\alpha)\sin(\alpha+\frac{\pi}{4})} = \frac{4\sqrt{2}}{\sqrt{2}}$$

$$\sum \frac{\sin(\frac{\pi}{4})}{\sin(\alpha)\sin(\alpha+\frac{\pi}{4})} = 4$$

$$\sum \frac{\sin(\overbrace{(\alpha+\frac{\pi}{4})}-\overbrace{\alpha})}{\sin(\alpha)\sin(\alpha+\frac{\pi}{4})} = 4$$

$$\sum \frac{\sin\left(\alpha+\frac{\pi}{4}\right)\cos\alpha}{\sin\alpha\sin\left(\alpha+\frac{\pi}{4}\right)} - \frac{\cos\left(\alpha+\frac{\pi}{4}\right)\sin\alpha}{\sin\alpha\sin\left(\alpha+\frac{\pi}{4}\right)} = 4$$

$$\sum \left(\cot\alpha - \cot\left(\alpha+\frac{\pi}{4}\right)\right) = 4$$

$$\sum_{n=1}^{6} \left(\cot\left(\theta+(n-1)\frac{\pi}{4}\right) - \cot\left(\theta+n\frac{\pi}{4}\right)\right) = 4$$

$$\cot\theta - \cot\left(\theta+\frac{\pi}{4}\right) + \cot\left(\theta+\frac{\pi}{4}\right) - \cot\left(\theta+2\frac{\pi}{4}\right) + \cot\left(\theta+2\frac{\pi}{4}\right) - \cot\left(\theta+\frac{3\pi}{4}\right) + \cdots + \cot\left(\theta+5\frac{\pi}{4}\right) - \cot\left(\theta+6\frac{\pi}{4}\right)$$

$= 4$

$\cot\theta - \cot\left(\theta+\frac{3\pi}{2}\right)$

$= 4$

$\cot\theta + \tan\theta$

$= 4$

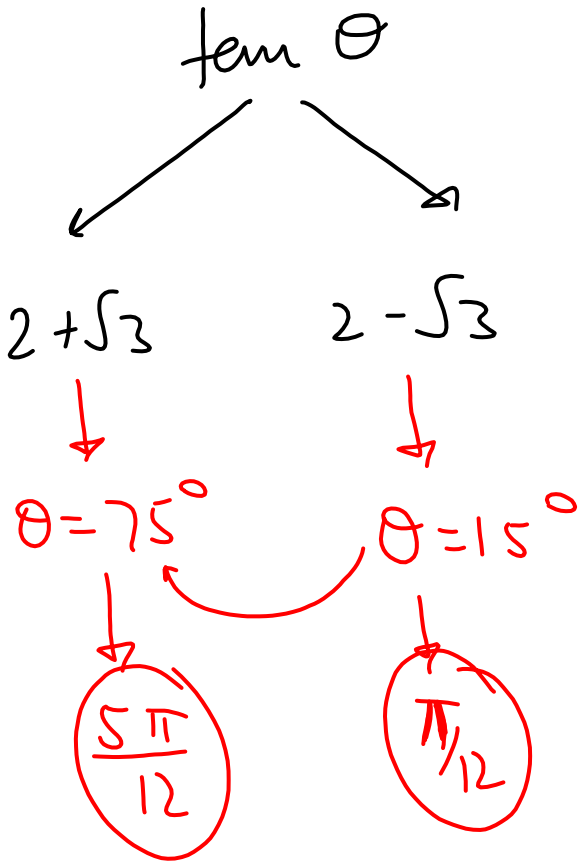
$\frac{1}{\tan\theta} + \tan\theta = 4$

$$1 + \tan^2\theta = 4\tan\theta$$

$$\tan^2\theta - 4\tan\theta + 1 = 0$$

$$\tan\theta = \frac{4 \pm \sqrt{16 - 4}}{2}$$

$$= \frac{4 \pm 2\sqrt{3}}{2}$$



Extended Compound Angle Formulae

Extended Compound Angle Formulae

$$\sin(A + B + C) = \sin A \cos B \cos C + \sin B \cos A \cos C + \sin C \cos A \cos B - \sin A \sin B \sin C$$

Formulas to remember

$$\sin(A+(B+C))$$

$$= \sin A \cos(B+C) + \cos A \sin(B+C)$$

$$= \sin A(\cos B \cos C - \sin B \sin C) + \cos A(\sin B \cos C + \cos B \sin C)$$

$$\sin(A+B+C)$$

$$= \cos A \cos B \cos C \left[\tan A + \tan B + \tan C - \tan A \tan B \tan C \right]$$

Extended Compound Angle Formulae

$$\cos(A + B + C) = \cos A \cos B \cos C - \cos A \sin B \sin C - \sin A \cos B \sin C - \sin A \sin B \cos C$$

$$\cos(A+B+C)$$

$$= \cos A \cos B \cos C \left[1 - \tan B \tan C - \tan A \tan C - \tan A \tan B \right]$$

$$= (\cos A \cos B \cos C)\left[1 - \sum \tan A \tan B\right]$$

Extended Compound Angle Formulae

$$\tan(A+B+C) = \frac{\tan A + \tan B + \tan C - \tan A \tan B \tan C}{1 - \tan A \tan B - \tan B \tan C - \tan C \tan A}$$

$$\tan(A+B+C) = \frac{\sin(A+B+C)}{\cos(A+B+C)}$$

$$\tan(A+B+C) = \frac{\sum \tan A - \tan A \tan B \tan C}{1 - \left(\sum \tan A \tan B\right)}$$

$$= \frac{\sum \tan A - \prod \tan A}{1 - \sum \tan A \tan B}$$

In a triangle ABC, if cos A cos B cos C = 1/3, then the value of Σ tan B tan C =

A. 1 B. 2 C. 3 D. 4

$A+B+C=\pi$

$\Sigma \tan A \tan B$

$\cos(A+B+C)=\cos\pi$

$(\cos A\cos B\cos C)(1-\Sigma\tan A\tan B)=-1$

$\frac{1}{3}(1-(\Sigma\tan A\tan B))=-1$

In a triangle ABC, find the value of cot A cot B + cot B cot C + cot C cot A

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

$$A + B + C = \pi$$

$$\tan(A + B + C) = \tan \pi$$

$$\frac{(\tan A + \tan B + \tan C) - \tan A \tan B \tan C}{1 - \tan A \tan B - \tan B \tan C - \tan C \tan A} = 0$$

$$\Rightarrow \frac{\tan A + \tan B + \tan C}{\tan A \tan B \tan C} = \frac{\tan A \tan B \tan C}{\tan A \tan B \tan C}$$

$$= 1$$

Important Results

1

$$\sin(A + B).\sin(A - B) = \sin^2 A - \sin^2 B = \cos^2 B - \cos^2 A$$

$$\sin(A+B)\cdot\sin(A-B)$$

$$= (\sin A\cos B + \cos A\sin B)(\sin A\cos B - \cos A\sin B)$$

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

$$= \sin^2 A(1-\sin^2 B) - (1-\sin^2 A)\sin^2 B$$

$$= \sin^2 A - \sin^2 A \sin^2 B - \sin^2 B + \sin^2 A \sin^2 B$$

$$= \boxed{\sin^2 A - \sin^2 B}$$

Important Results

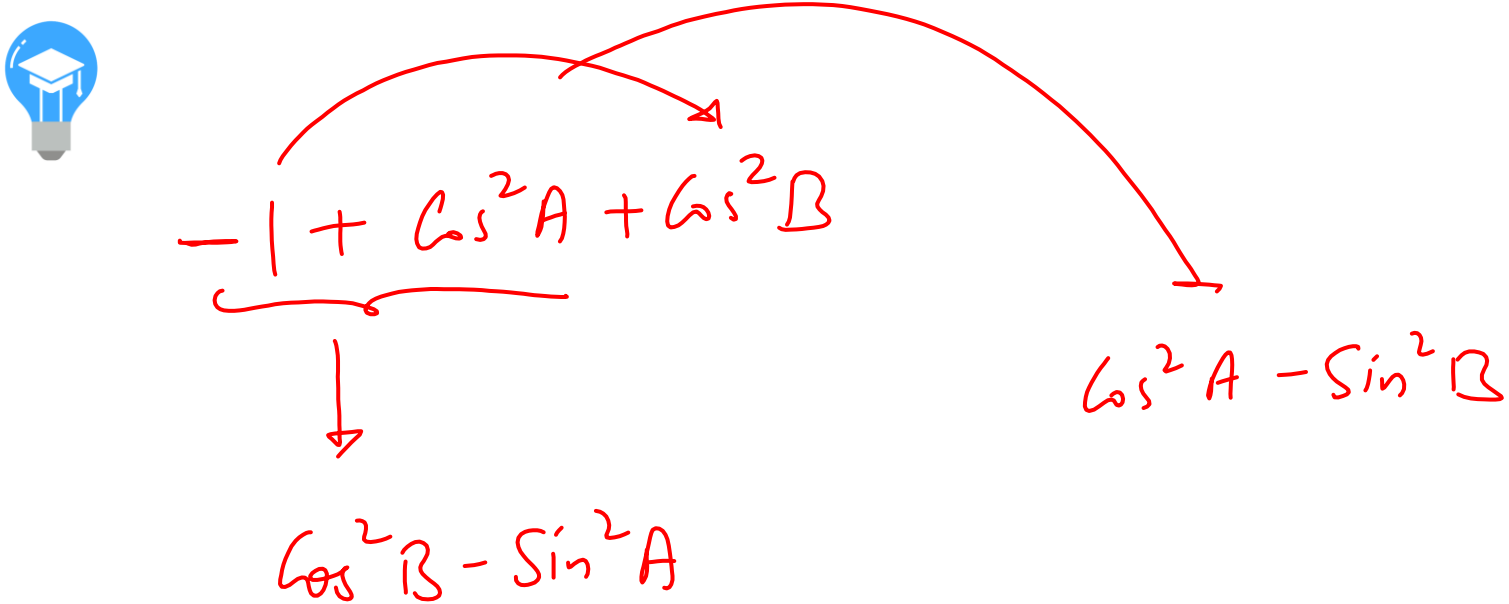
2

$$\cos(A + B)\cos(A - B) = \cos^2 A - \sin^2 B = \cos^2 B - \sin^2 A$$

$$(\cos A \cos B - \sin A \sin B)(\cos A \cos B + \sin A \sin B)$$

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

$$= \cos^2 A \cos^2 B - (1 - \cos^2 A)(1 - \cos^2 B)$$


$-1+\cos^2 A+\cos^2 B$
$\cos^2 A-\sin^2 B$
$\cos^2 B-\sin^2 A$

Find the value of $\dfrac{\sin\theta}{\sin^2\left(\frac{\theta}{2}+\frac{\pi}{12}\right)-\sin^2\left(\frac{\theta}{2}-\frac{\pi}{12}\right)}$

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

$$\frac{\sin\theta}{\sin\left(\frac{\theta}{2}+\frac{\pi}{12}+\frac{\theta}{2}-\frac{\pi}{12}\right)\sin\left(\frac{\theta}{2}+\frac{\pi}{12}-\frac{\theta}{2}+\frac{\pi}{12}\right)}$$

$$= \frac{\sin\theta}{\sin\theta\sin(\pi/6)} = 2$$

If $A + B = \frac{\pi}{3}$, then find the value of

$\cos^2 A + \cos^2 B - \cos A.\cos B$

A. $\frac{1}{2}$ **B.** $\frac{3}{2}$ **C.** $\frac{3}{4}$ **D.** 1

HW

#JEELiveDailySchedule

jee

11th

Namo Sir | Physics

6:00 - 7:30 PM

Ashwani Sir | Chemistry

7:30 - 9:00 PM

Sameer Sir | Maths

9:00 - 10:30 PM

12th

Jayant Sir | Physics

1:30 - 3:00 PM

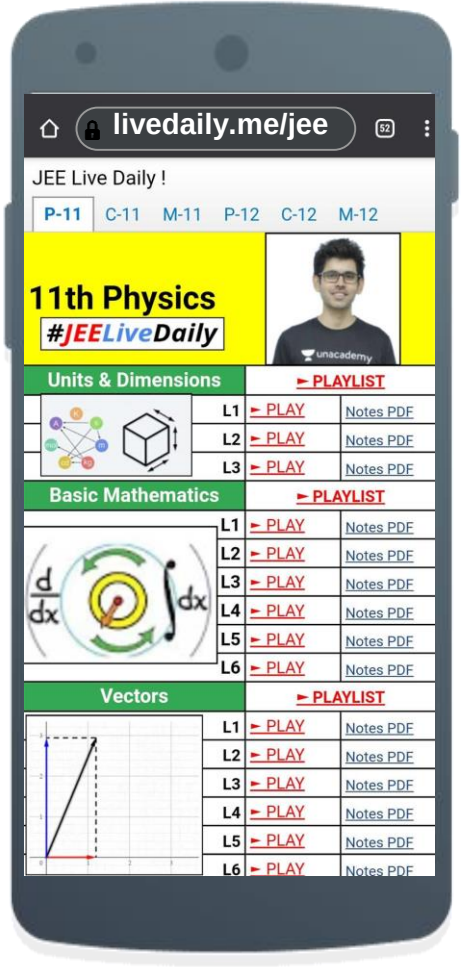
Anupam Sir | Chemistry

3:00 - 4:30 PM

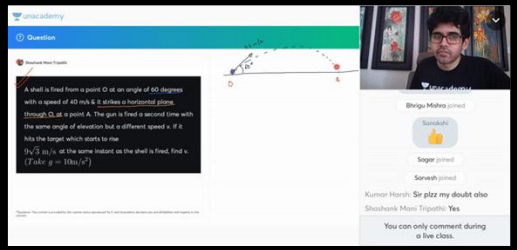
Nishant Sir | Maths

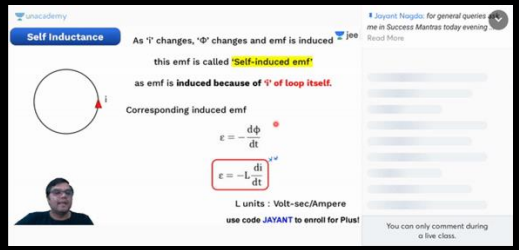
4:30 - 6:00 PM

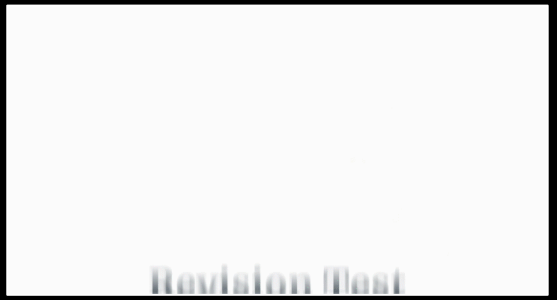
livedaily.me/jee

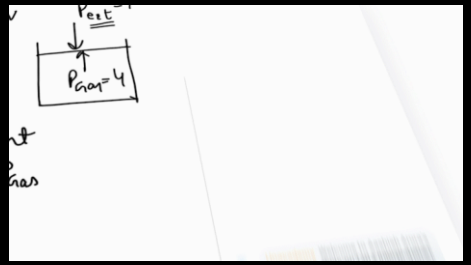


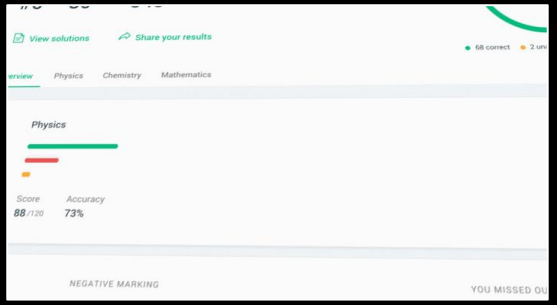
Unacademy Subscription











+ LIVE Class Environment

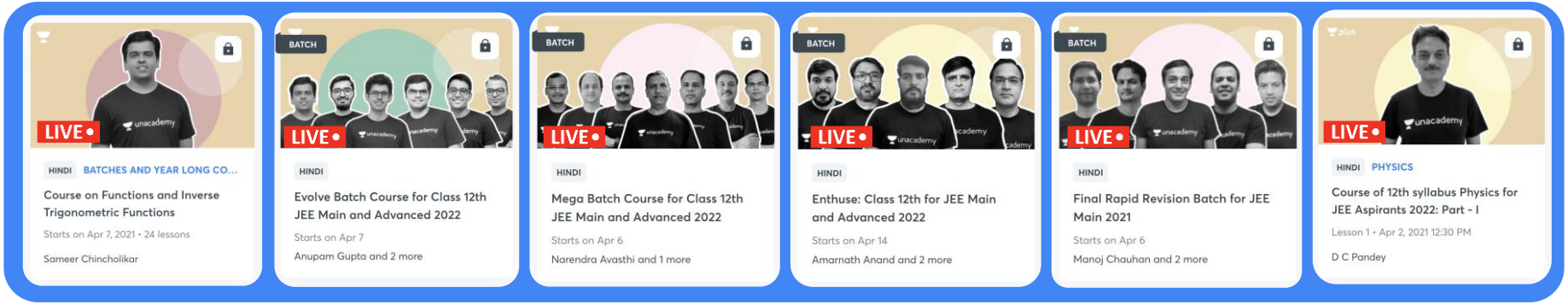
- + **LIVE Polls** & **Leaderboard**
- + **LIVE Doubt** Solving
- + **LIVE** Interaction

+ Performance Analysis

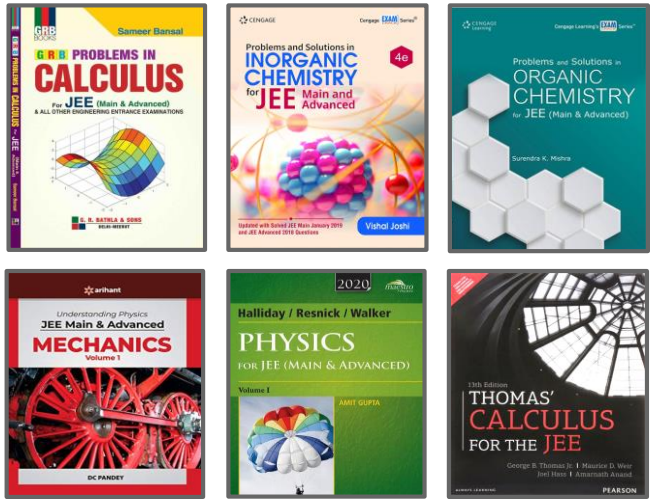
- + **Weekly Test Series**
- + **DPPs** & **Quizzes**

India's **BEST** Educators

Unacademy Subscription



If you want to be the **BEST**
"Learn" from the **BEST**



jee

Top Results

Bratin Mondal

100 %ile

Amaiya Singhal
99.97

Adnan
99.95

Ashwin Prasanth
99.94

Tanmay Jain
99.86

Kunal Lalwani
99.81

Utsav Dhanuka
99.75

Aravindan K Sundaram
99.69

Manas Pandey
99.69

Mihir Agarwal
99.63

Akshat Tiwari
99.60

Sarthak Kalankar
99.59

Vaishnovi Arun
99.58

Devashish Tripathi
99.52

Maroof
99.50

Tarun Gupta
99.50

Siddharth Kaushik
99.48

Mihir Kothari
99.39

Sahil
99.38

Vaibhav Dhanuka
99.34

Pratham Kadam
99.29

Shivam Gupta
99.46

Shrish
99.28

Yash Bhaskar
99.10

Subhash Patel
99.02

Ayush Kale
98.85

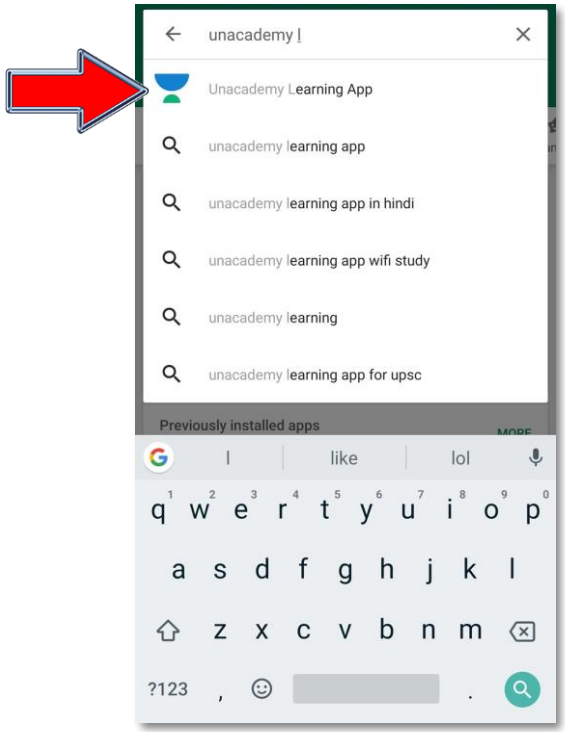
Ayush Gupta
98.67

Megh Gupta
98.59

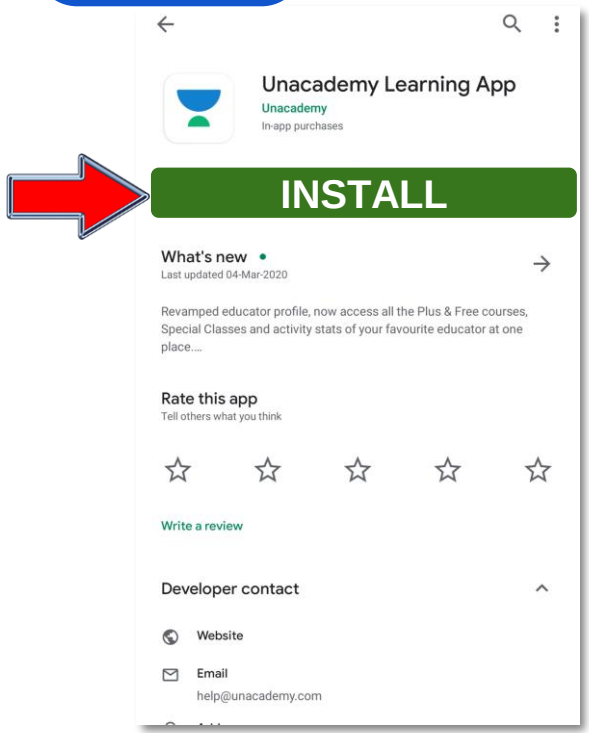
Naman Goyal
98.48

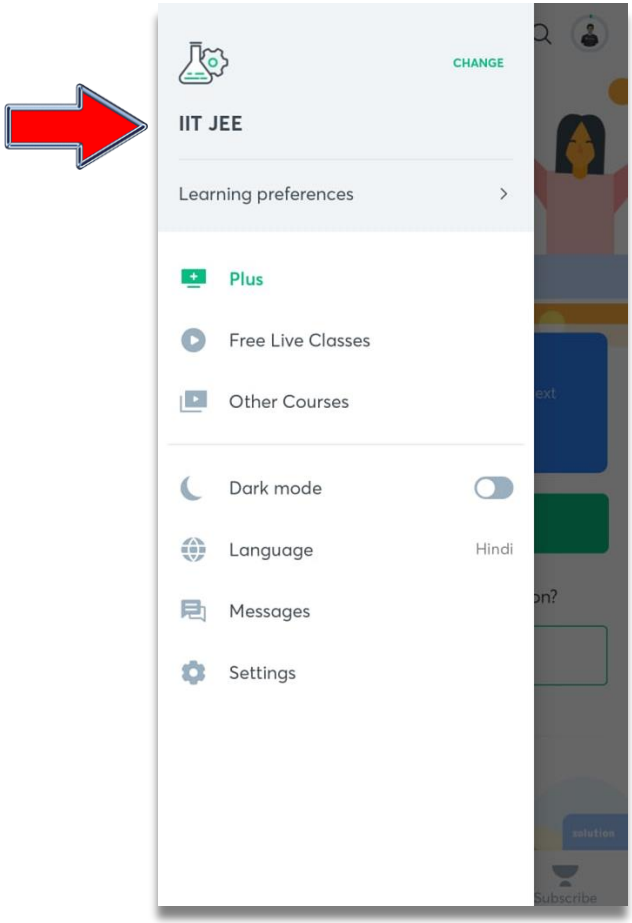
MIHIR PRAJAPATI
98.16

Step 1

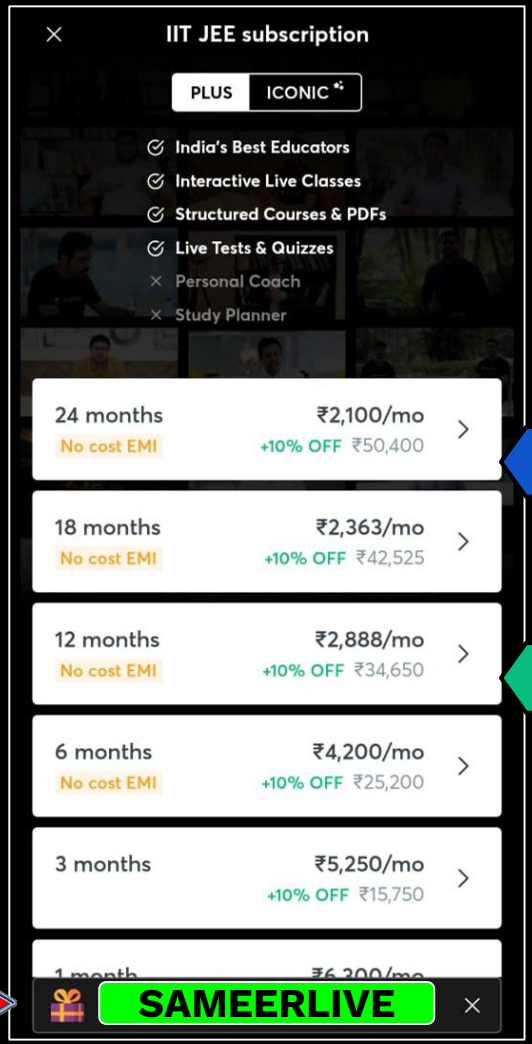

unacademy l
Unacademy Learning App
unacademy learning app
unacademy learning app in hindi
unacademy learning app wifi study
unacademy learning
unacademy learning app for upsc
Previously installed apps
I
like
lol

Step 2


Unacademy Learning App
Unacademy
In-app purchases
INSTALL
What's new
Last updated 04-Mar-2020
Revamped educator profile, now access all the Plus & Free courses, Special Classes and activity stats of your favourite educator at one place....
Rate this app
Tell others what you think
Write a review
Developer contact
Website
Email
help@unacademy.com


CHANGE
IIT JEE
Learning preferences
Plus
Free Live Classes
Other Courses
Dark mode
Language
Hindi
Messages
Settings


9:41



11th / 9, 10

12th / Drop

jee

unacademy

IIT JEE MEGA SUBSCRIPTION OFFER

For 2022 Aspirants

Buy 1 Year Unacademy Subscription and get additional

3 MONTHS FREE

For 2023 Aspirants

Buy 2 Year Unacademy Subscription and get additional

4 MONTHS FREE

Limited Period

OFFER

jee

EMERGE 3.0 BATCH

JEE Main & Advanced 2023

Starting on 12th May

Thank You

+ SUBSCRIBE

@sameer_iitr

#JEE Live Daily

jee

LIKE & SHARE

PDF Download Now !