jee LIVE daily 3.0

Condition of Common Root

Quadratic Equations

4

$$\alpha + \beta = \frac{-b}{a}$$

$$\alpha\beta = \frac{c}{a}$$

$$|\alpha - \beta| = \frac{\sqrt{D}}{|a|}$$

jee LIVE daily 3.0

Sameer Chincholikar

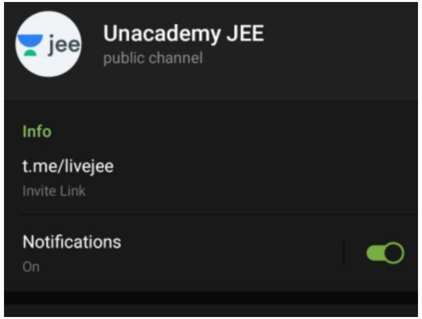
B.Tech, M.Tech - IIT-Roorkee

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

sameer_iitr

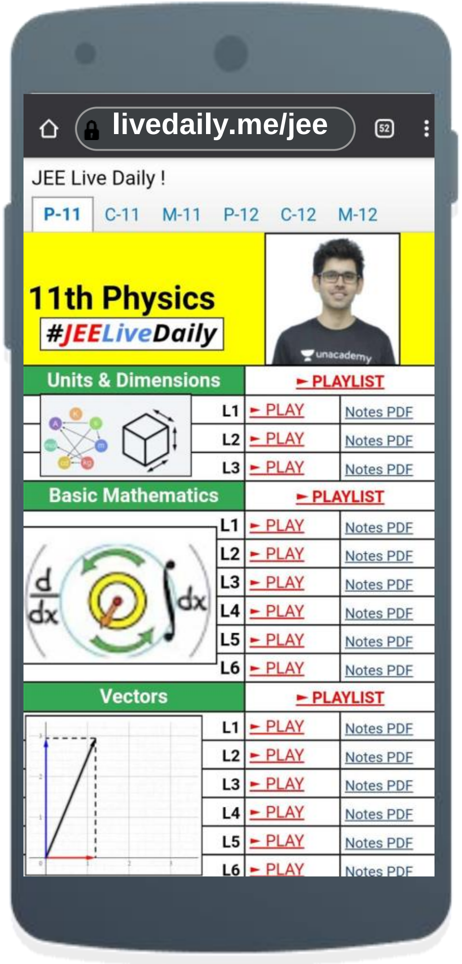
#JEE Live Daily

Telegram Channel

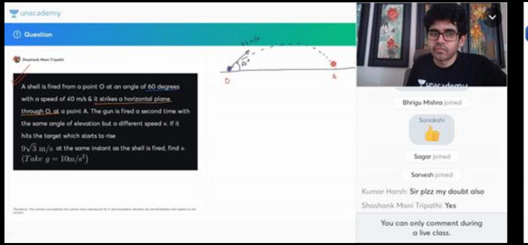


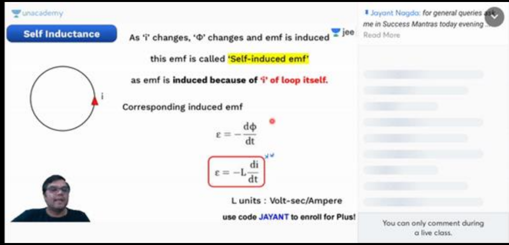
livedaily.me/jee

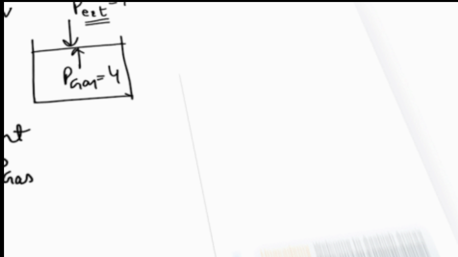
jee

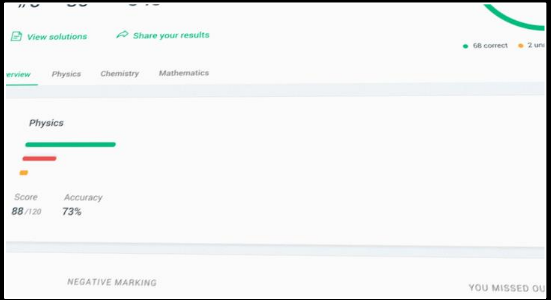


Unacademy Subscription









LIVE Class Environment

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

Performance Analysis

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

India's **BEST** Educators

Unacademy Subscription

HINDI BATCHES AND YEAR LONG CO...

Course on Functions and Inverse Trigonometric Functions

Starts on Apr 7, 2021 • 24 lessons

Sameer Chincholikar

HINDI

Evolve Batch Course for Class 12th JEE Main and Advanced 2022

Starts on Apr 7

Anupam Gupta and 2 more

HINDI

Mega Batch Course for Class 12th JEE Main and Advanced 2022

Starts on Apr 6

Narendra Avasthi and 1 more

HINDI

Enthuse: Class 12th for JEE Main and Advanced 2022

Starts on Apr 14

Amarnath Anand and 2 more

HINDI

Final Rapid Revision Batch for JEE Main 2021

Starts on Apr 6

Manoj Chauhan and 2 more

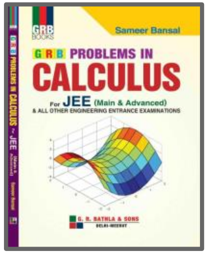
HINDI PHYSICS

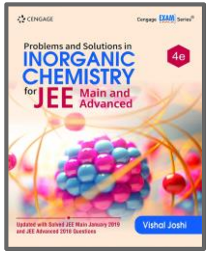
Course of 12th syllabus Physics for JEE Aspirants 2022: Part - I

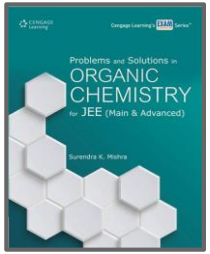
Lesson 1 • Apr 2, 2021 12:30 PM

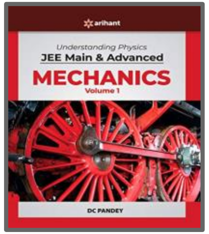
D C Pandey

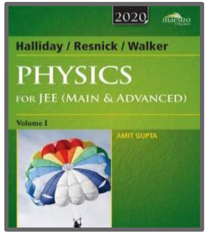
If you want to be the **BEST**
"Learn" from the **BEST**

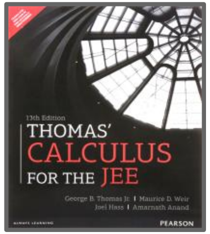












jee
Top Results
Bratin Mondal
100 %ile
unacademy
Amaiya Singhal 99.97
Adnan 99.95
Ashwin Prasanth 99.94
Tanmay Jain 99.86
Kunal Lalwani 99.81
Utsav Dhanuka 99.75
Aravindan K Sundaram 99.69
Manas Pandey 99.69
Mihir Agarwal 99.63
Akshat Tiwari 99.60
Sarthak Kalankar 99.59
Vaishnovi Arun 99.58
Devashish 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

jee

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	11th / 9, 10
18 months No cost EMI	₹2,363/mo +10% OFF ₹42,525	
12 months No cost EMI	₹2,888/mo +10% OFF ₹34,650	12th / Drop
6 months No cost EMI	₹4,200/mo +10% OFF ₹25,200	
3 months	₹5,250/mo +10% OFF ₹15,750	
1 month		

SAMEERLIVE

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	₹3,750/mo +10% OFF ₹90,000
18 months No cost EMI	₹4,000/mo +10% OFF ₹72,000
12 months No cost EMI	₹4,875/mo +10% OFF ₹58,500
6 months No cost EMI	₹5,700/mo +10% OFF ₹34,200

11th / 9, 10 (24 months)

12th / Drop (12 months)

To be paid as a one-time payment

SAMEERLIVE

LET'S BEGIN!!

Common Root

Find the value of k for which the equations $3x^2 + 4kx + 2 = 0$ and $2x^2 + 3x - 2 = 0$ have a common root.

$$2x^2 + 3x - 2 = 0$$

$$2x^2 + 4x - x - 2 = 0$$

$$(2x-1)(x+2) = 0$$

$$\boxed{x = \frac{1}{2}, -2}$$

Case-1

Common root, $x = \frac{1}{2}$

$$3\left(\frac{1}{2}\right)^2 + 4k\left(\frac{1}{2}\right) + 2 = 0$$

$$\frac{3}{4} + 2 + 2k = 0$$

$$\boxed{k = -\frac{11}{8}}$$

jee

Case-2 :

Common root $\Rightarrow x = -2$

$$3x^2 + 4Kx + 2 = 0$$

$$12 + (-8)K + 2 = 0$$

$$8K = 14$$

$$\boxed{K = 7/4}$$

Common Root

1. Both Roots Common

Consider two quadratic equations,

$a_1x^2 + b_1x + c_1 = 0$ &

$a_2x^2 + b_2x + c_2 = 0.$

$$\boxed{\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}.}$$

Eg:

$x^2 - 5x + 6 = 0 \rightarrow (x-2)(x-3) = 0$

$2x^2 - 10x + 12 = 0 \rightarrow 2(x-2)(x-3) = 0$

$$\boxed{\frac{1}{2} = \frac{1}{2} = \frac{1}{2}}$$

If the equation $k(6x^2+3)+rx+2x^2-1=0$ and $6k(2x^2+1)+px+4x^2-2=0$ have both the roots common, then the value of $2r-p$ is

A. 0

B. 1

C. -1

D. None of these

$$\begin{cases} k(6x^2+3)+rx+2x^2-1=0 \\ 6k(2x^2+1)+px+4x^2-2=0 \end{cases}$$

$$(6k+2)x^2+rx+(3k-1)=0$$

$$(12k+4)x^2+px+(6k-2)=0$$

$$\frac{1}{2}=\frac{r}{p}=\frac{1}{2}$$

$$p=2r$$

$$\boxed{2r-p=0}$$

jee

NOTE: Cross Multiplication Method

$a_1x + b_1y + c_1 = 0$

$a_2x + b_2y + c_2 = 0$

$$\begin{array}{cccccc} a_1 & b_1 & c_1 & a_1 & b_1 \\ a_2 & b_2 & c_2 & a_2 & b_2 \end{array}$$

$$\boxed{\frac{x}{b_1c_2-b_2c_1}=\frac{-y}{a_1c_2-a_2c_1}=\frac{1}{a_1b_2-a_2b_1}}$$

$$\frac{y}{c_1a_2-c_2a_1}$$

Common Root

2. One Root Common:

Consider two quadratic equations,

$\mathbf{a_1x^2 + b_1x + c_1 = 0}$ **&**

$\mathbf{a_2x^2 + b_2x + c_2 = 0.}$

if α is a common root, then

$a_1\boxed{\alpha^2} + b_1\boxed{\alpha} + c_1 = 0$

$a_2\alpha^2 + b_2\alpha + c_2 = 0$

$$\boxed{\frac{\alpha^2}{b_1c_2 - b_2c_1} = \frac{-\alpha}{a_1c_2 - a_2c_1} = \frac{1}{a_1b_2 - a_2b_1}}$$

$\alpha^2 = ?$

$\boxed{\alpha = ?} \rightarrow$ square

equate

A value of $\boxed{b}$ for which the equations $x^2 + bx - 1 = 0$, $x^2 + x + b = 0$ having one root in common is

A. $-\sqrt{2}$

B. $-i\sqrt{3}$

C. $i\sqrt{5}$

D. $\sqrt{2}$

JEE Adv. 2011

$$\begin{cases} x^2 + bx - 1 = 0 \\ x^2 + x + b = 0 \end{cases}$$

α

$$\begin{cases} \alpha^2 + b\alpha - 1 = 0 \\ \alpha^2 + 1 \cdot \alpha + b = 0 \end{cases}$$

$$\frac{\alpha^2}{b^2+1} = \frac{-\alpha}{b+1} = \frac{1}{1-b}$$

$$\alpha^2 = \frac{b^2+1}{1-b} \; ; \quad \alpha = \frac{-(b+1)}{(1-b)}$$

jee

$$\alpha^2 = \alpha^2$$

$$\frac{b^2+1}{\cancel{(1-b)}} = \frac{(b+1)^2}{(1-b)^{\cancel{2}}}$$

$$\Rightarrow (b^2+1)(1-b) = (b+1)^2$$

$$\Rightarrow \cancel{b^2} - b^3 + \cancel{1} - b = \cancel{b^2} + 2b + \cancel{1}$$

$$b^3 + 3b = 0$$

$$b(b^2+3) = 0$$

$$b = 0 \qquad b^2 + 3 = 0$$

$$b^2 = -3$$

$$b = \pm\sqrt{-3}$$

$$\boxed{b = \pm\sqrt{3}\,i}$$

If it is known that a, b, c are real and the quadratic equations $ax^2 + bx + c = 0$ and $2x^2 + 3x + 4 = 0$ have a common root then $a : b : c$ is equal to:

A. 2 : 3 : 4

B. 1 : 2 : 3

C. 3 : 4 : 5

D. Data insufficient

$$\begin{cases} ax^2+bx+c=0 \\ 2x^2+3x+4=0 \end{cases} \longrightarrow D = 9-4(2)(4)$$

$$\boxed{\frac{a}{2}=\frac{b}{3}=\frac{c}{4}}$$

$$\boxed{D<0}$$

Eg. $(x-1)(x-i)=0 \rightarrow x=1,\ x=i$

$$x^2 - ix - x + i = 0$$

$$x^2 - (1+i)x + i = 0$$

Eg. $(x-i)(x-2i)=0 \rightarrow x=i,\ x=2i$

If the equation $x^2 + ax + 12 = 0$; $x^2 + bx + 15 = 0$; $x^2 + (a + b)x + 36 = 0$ have a common positive root, the values of a and b, respectively, are

A. -7, -8

B. -8, -7

C. -5, -3

D. No value of a exist

$x^2 + ax + 12 = 0$

$x^2 + bx + 15 = 0$

$x^2 + (a+b)x + 36 = 0$

α

$\alpha^2 + a\alpha + 12 = 0$

$\alpha^2 + b\alpha + 15 = 0$

$\alpha^2 + (a+b)\alpha + 36 = 0$

Eqn 1 + Eqn 2 - Eqn 3

$x^2 + 27 - 36 = 0$

$$\alpha^2 = 9$$

$$\alpha = \pm 3$$

$\alpha = 3$ ($\because$ α has to +ve)

$\alpha = -3$ $\rightarrow$ reject

use $\alpha = 3$ in Eq^n (1).

$$9 + 3a + 12 = 0$$

$$\boxed{a = -7}$$

use $\alpha = 3$ in Eq^n (2).

$$9 + 3b + 15 = 0$$

$$\boxed{b = -8}$$

If the quadratic equation $x^2 + bx + c = 0$ and $x^2 + cx + b = 0$ $(b \neq c)$ have a common root then prove that their uncommon roots are the roots of the equation $x^2 + x + bc = 0$

$$\begin{cases} x^2 + bx + c = 0 \quad , (\alpha, \beta) \\ x^2 + cx + b = 0 \quad , (\alpha, \gamma) \end{cases}$$

$\alpha + \beta = -b$ | $\alpha + \gamma = -c$

$\alpha\beta = c$ | $\alpha\gamma = b$

$\alpha^2 + b\alpha + c = 0$

$\alpha^2 + c\alpha + b = 0$

$\ominus$: $(b-c)\alpha + c - b = 0$

$(b-c)\alpha = (b-c)$

$\boxed{\alpha = 1}$

$\alpha\beta = c$ & $\alpha = 1 \Rightarrow \beta = c$

& $\alpha\gamma = b$ & $\alpha = 1 \Rightarrow \gamma = b$

$$\boxed{x^2 - (b+c)x + bc = 0} \rightarrow \boxed{x^2 + x + bc = 0}$$

$\alpha = 1$ is root of $x^2 + bx + c = 0$

$$\Rightarrow 1 + b + c = 0 \Rightarrow \boxed{b + c = -1}$$

If $Q_1(x) = x^2 + (k - 29)x - k$ and $Q_2(x) = 2x^2 + (2k - 43)x + k$ both are factors of a cubic polynomial $P(x)$, then the value of k can be:

A. ~~0~~

B. 33

C. 23

D. ~~30~~

$P(x) : (\alpha, \beta, \gamma)$

$$P(x) = \frac{a(x-\alpha)(x-\beta)(x-\gamma)}{(x-\alpha)(x-\beta)}$$

(α, β)

(β, γ)

(γ, α)

jee

$$\begin{cases} x^2+(k-29)x-k=0 & \text{--- } (1) \\ 2x^2+(2k-43)x+k=0 & \text{--- } (2) \end{cases}$$

$$\boxed{\alpha = -\frac{k}{5}}$$

$$\alpha^2+(k-29)\alpha-k=0$$

$$\begin{cases} 2\alpha^2+(2k-43)\alpha+k=0 \\ 2\alpha^2+(2k-58)\alpha-2k=0 \end{cases}$$

$(-)$: $\quad 15\alpha+3k=0$

$$\Rightarrow \frac{k^2}{25}-\frac{k}{5}(k-29)-k=0$$

$$\Rightarrow k(k-5(k-29)-25)=0$$

$\Rightarrow \boxed{K = 0}$

&

$K - 5K + 29\times5 - 5\times5 = 0$

$-4K + 24\times5 = 0$

$\boxed{K = 30}$

If one root of the equation $x^2 + ax + b = 0$ is also a root of $x^2 + mx + n = 0$, show that its other root is a root of $x^2 + (2a - m)x + a^2 - am + n = 0$.

$$\begin{cases} x^2 + ax + b = 0 & ; (\alpha, \beta) \\ x^2 + mx + n = 0 & ; (\alpha, \_\_) \end{cases}$$

$$\alpha + \beta = -a$$

$$\boxed{\alpha = -\beta - a}$$

$$(-\beta - a)^2 + m(-\beta - a) + n = 0$$

$$\beta^2 + a^2 + 2a\beta - m\beta - ma + n = 0$$

$$\boxed{\beta^2 + (2a - m)\beta + a^2 - ma + n = 0}$$

#JEELiveDaily Schedule

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

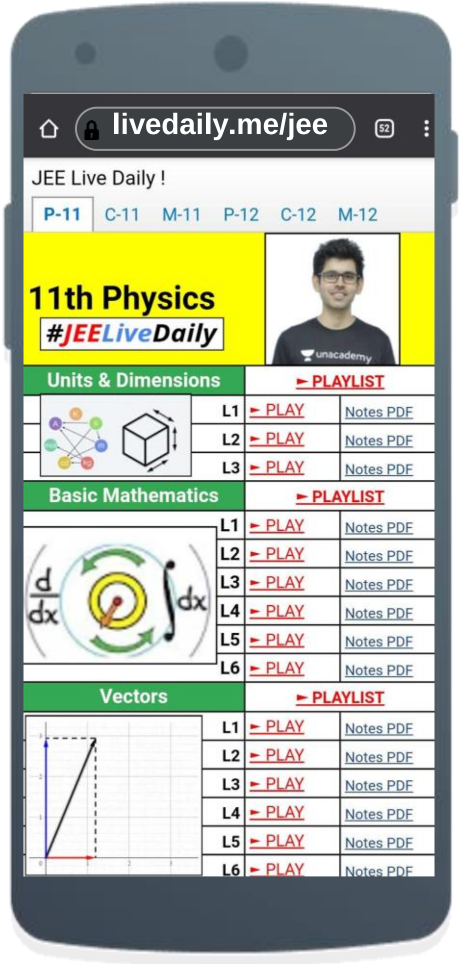
3:00 - 4:30 PM

Nishant Sir | Maths

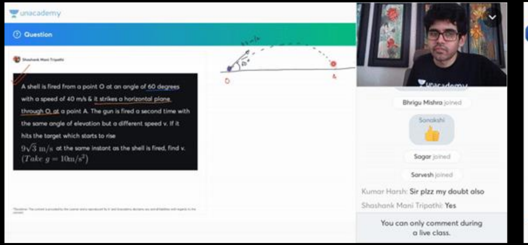
4:30 - 6:00 PM

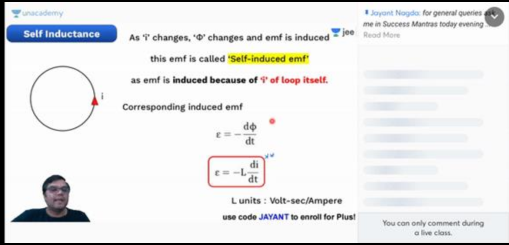
livedaily.me/jee

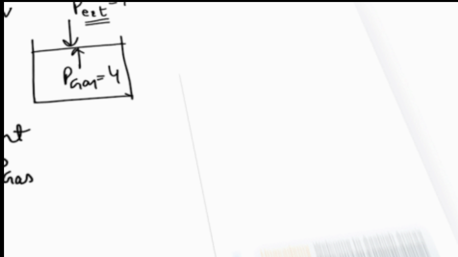
jee

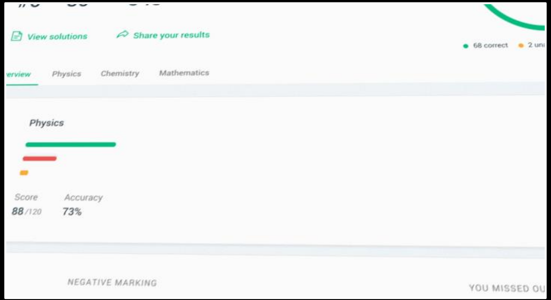


Unacademy Subscription









LIVE Class Environment

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

Performance Analysis

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

India's **BEST** Educators

Unacademy Subscription

HINDI BATCHES AND YEAR LONG CO...

Course on Functions and Inverse Trigonometric Functions

Starts on Apr 7, 2021 • 24 lessons

Sameer Chincholikar

HINDI

Evolve Batch Course for Class 12th JEE Main and Advanced 2022

Starts on Apr 7

Anupam Gupta and 2 more

HINDI

Mega Batch Course for Class 12th JEE Main and Advanced 2022

Starts on Apr 6

Narendra Avasthi and 1 more

HINDI

Enthuse: Class 12th for JEE Main and Advanced 2022

Starts on Apr 14

Amarnath Anand and 2 more

HINDI

Final Rapid Revision Batch for JEE Main 2021

Starts on Apr 6

Manoj Chauhan and 2 more

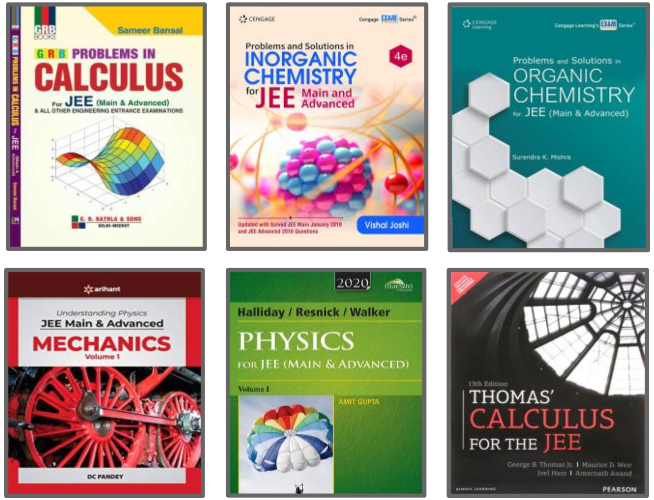
HINDI PHYSICS

Course of 12th syllabus Physics for JEE Aspirants 2022: Part - I

Lesson 1 • Apr 2, 2021 12:30 PM

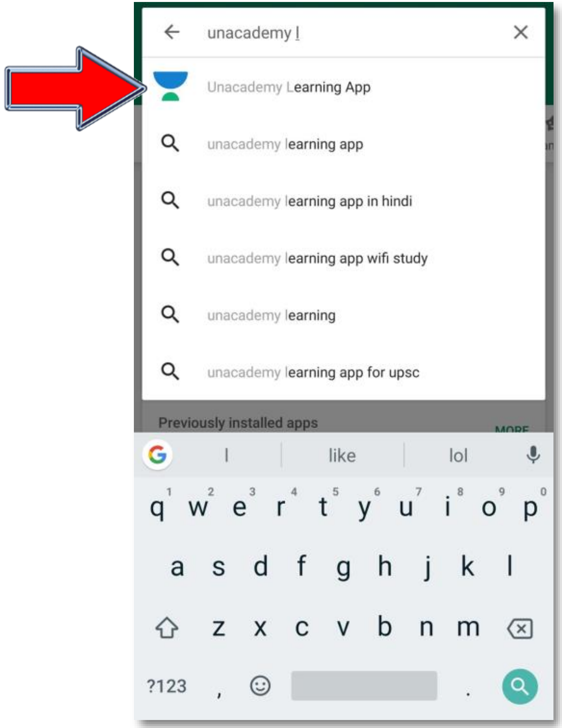
D C Pandey

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

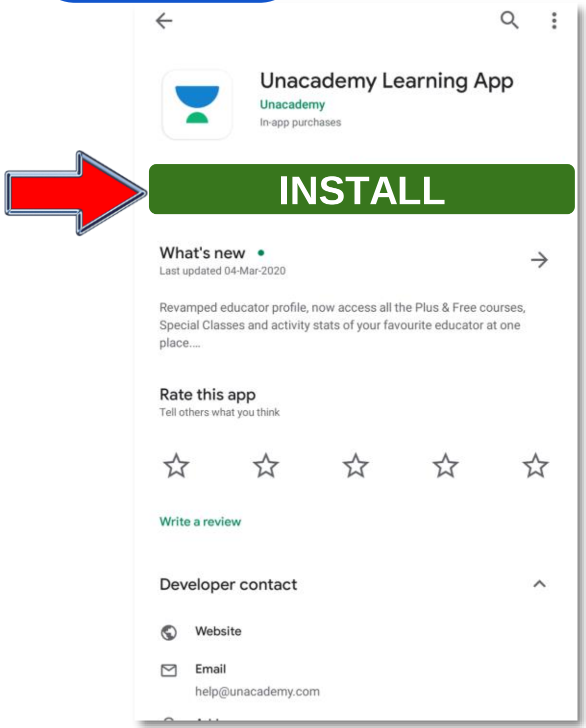


jee
Top Results
Bratin Mondal
100 %ile
unacademy
Amaiya Singhal
99.97
Adnan
99.95
Ashwin Prasanth
99.94
Tanmay Jain
99.86
Kunal Lalwani
99.81
Utsav Dhanuka
99.75
Aravindan K Sundaram
99.69
Manas Pandey
99.69
Mihir Agarwal
99.63
Akshat Tiwari
99.60
Sarthak Kalankar
99.59
Vaishnovi Arun
99.58
Devashish 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

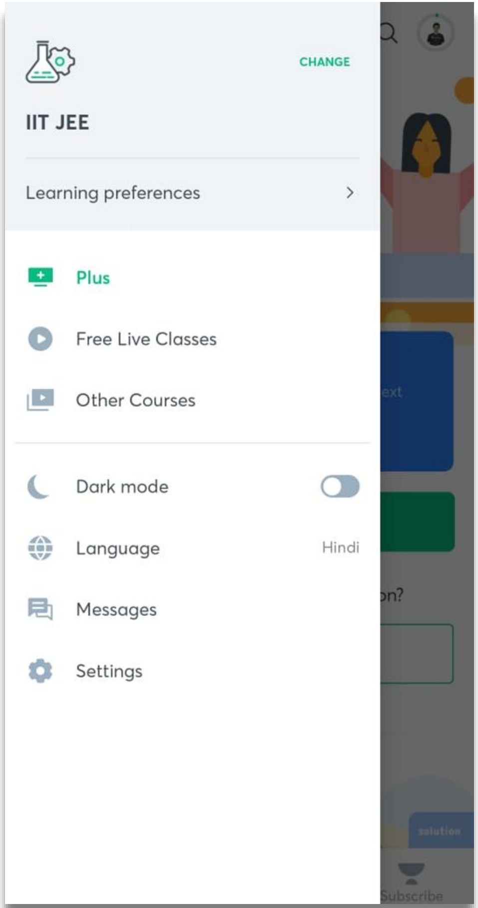
Step 1


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
l
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

jee


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


9:41

jee

IIT JEE subscription

PLUS | ICONIC

- India's Best Educators
- Interactive Live Classes
- Structured Courses & PDFs
- Live Tests & Quizzes
- Personal Coach
- Study Planner

24 months	₹2,100/mo	
No cost EMI	+10% OFF ₹50,400	11th / 9, 10
18 months	₹2,363/mo	
No cost EMI	+10% OFF ₹42,525	
12 months	₹2,888/mo	
No cost EMI	+10% OFF ₹34,650	12th / Drop
6 months	₹4,200/mo	
No cost EMI	+10% OFF ₹25,200	
3 months	₹5,250/mo	
	+10% OFF ₹15,750	
1 month	₹6,300/mo	

SAMEERLIVE

jee

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	₹3,750/mo +10% OFF ₹90,000
18 months No cost EMI	₹4,000/mo +10% OFF ₹72,000
12 months No cost EMI	₹4,875/mo +10% OFF ₹58,500
6 months No cost EMI	₹5,700/mo +10% OFF ₹34,200

11th / 9, 10

12th / Drop

To be paid as a one-time payment

SAMEERLIVE


jee
EMERGE 3.0 BATCH
JEE Main & Advanced 2023
Started on 12th May
unacademy
unacademy
unacademy
unacademy
unacademy
unacademy

Upcoming Batches in June

unacademy

Nurture 2.0 Batch (Class 11th) : JEE Main & Advanced 2023 — Starts on 2nd June 2021

Evolve Batch (Class 12th) : JEE Main & Advanced 2022 — Starts on 2nd June 2021

Emerge Batch (Class 11th) : JEE Main & Advanced 2023 — Starts on 8th June 2021

Evolve Batch (Class 12th) : JEE Main & Advanced 2022 — Starts on 9th June 2021

All Stars Batch : JEE Main 2021 — Starts on 9th June 2021

Emerge Batch (Class 11th) : JEE Main & Advanced 2023 — Starts on 16th June 2021

Thank You

@sameer_iitr

#JEE Live Daily

+ SUBSCRIBE

LIKE & SHARE

jee

PDF Download Now !