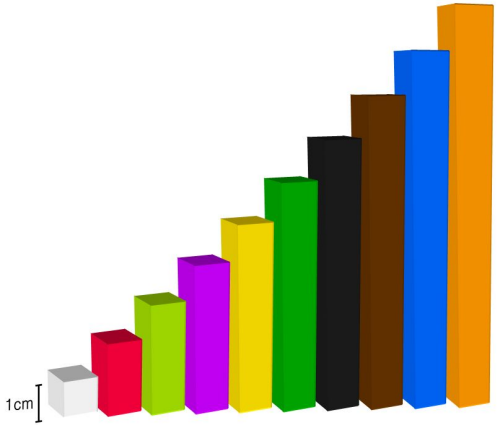
jee Practice Problems 3.0

# Sequences and Series

## JPP 1





Sameer Chincholikar

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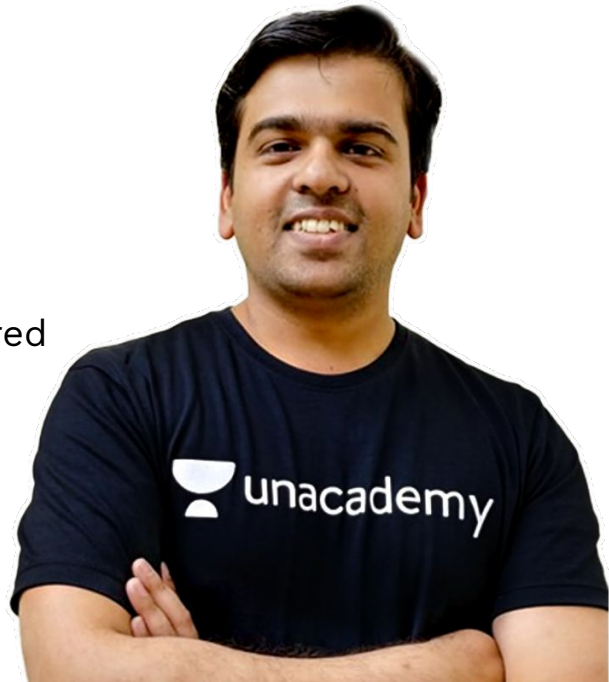
## Sameer Chincholikar

**B.Tech, M.Tech - IIT-Roorkee**

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

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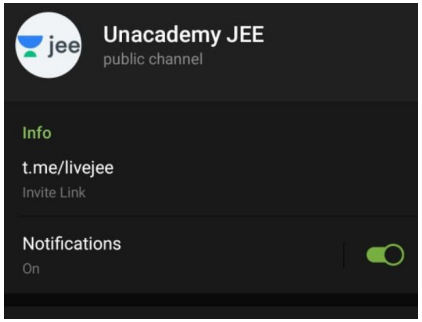


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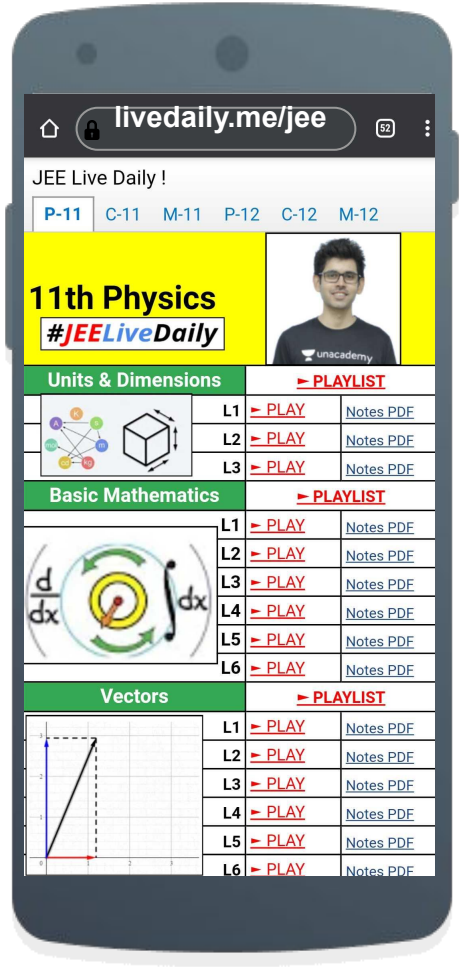


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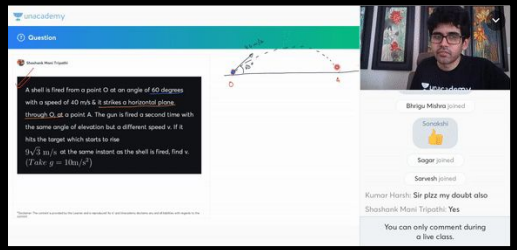


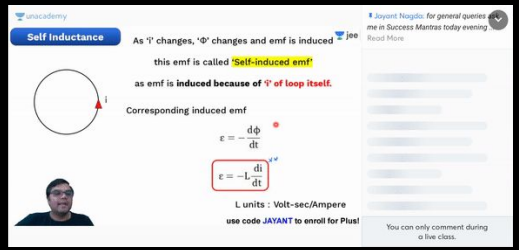


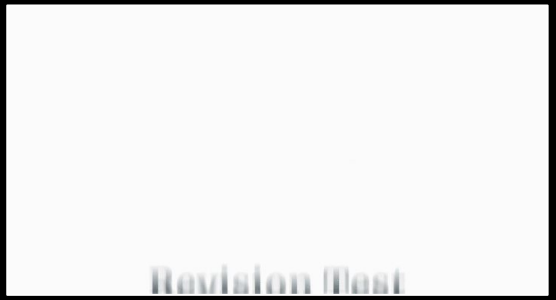


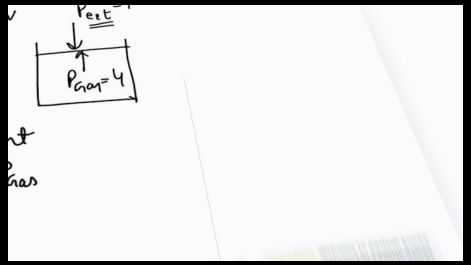


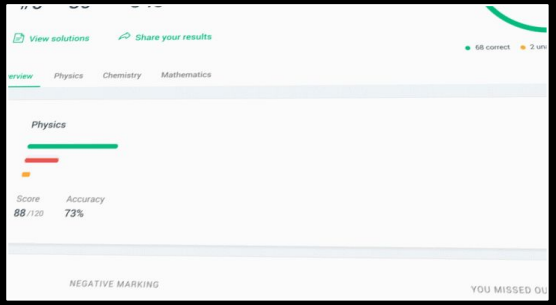


## + LIVE Class Environment

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

## + Performance Analysis

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- + **DPPs** & **Quizzes**

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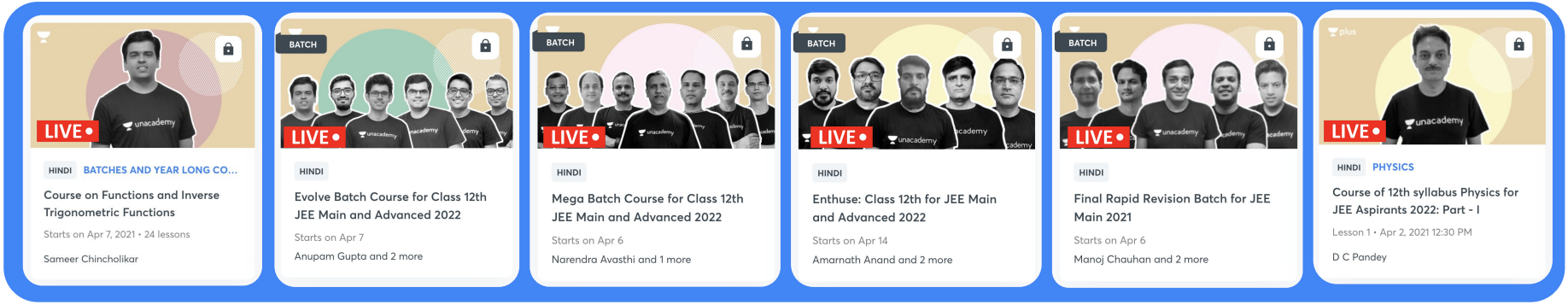


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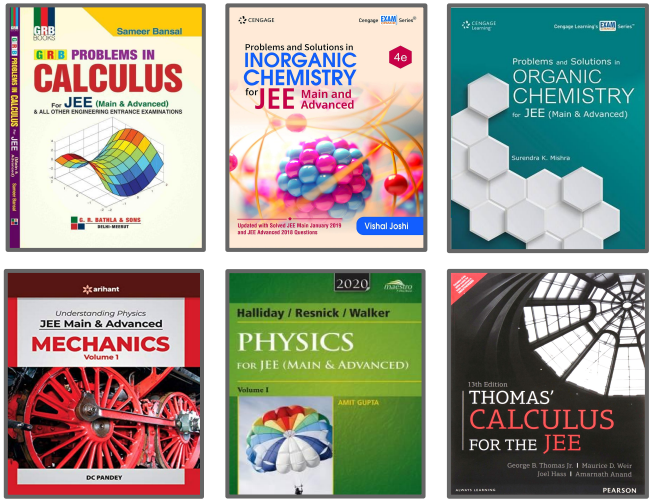

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# Top Results

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**100 %ile**


Amaiya Singhal
99.97

Adnan
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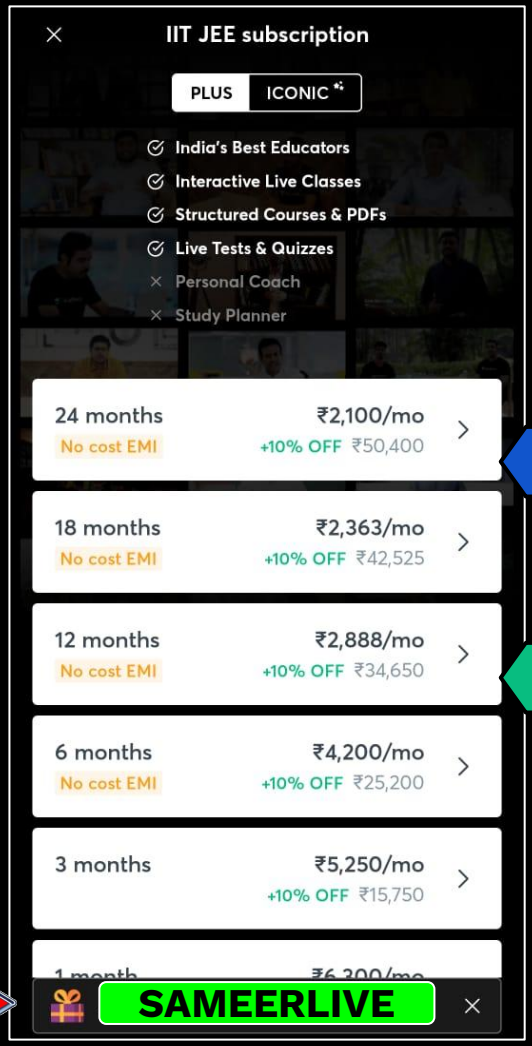


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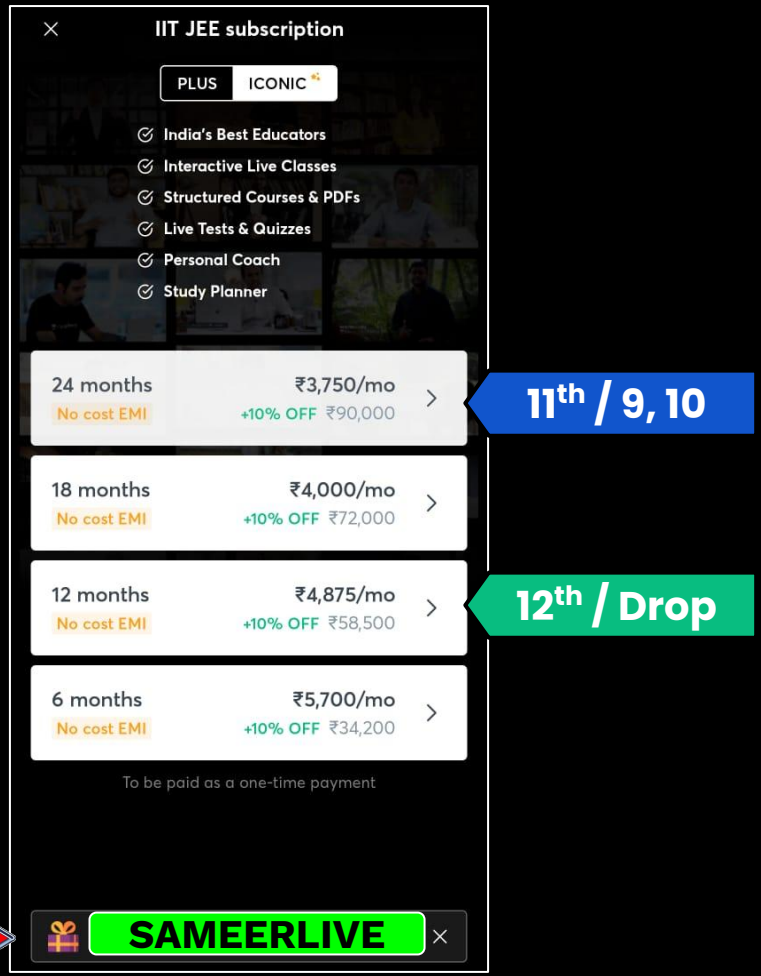
11th / 9, 10

12th / Drop




11th / 9, 10

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If the roots of the equation $x^3 - 12x^2 + 39x - 28 = 0$ are in A.P. , then their common difference is:

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

If $S_1$ is the sum of an arithmetic series of 'n' odd number of terms and $S_2$, the sum of the terms of the series in odd places then $S_1/S_2$ =

A. $\frac{2n}{n+1}$

B. $\frac{n}{n+1}$

C. $\frac{n+1}{2n}$

D. $\frac{n+1}{n}$

The sum of n terms of ‘m’ A.P.’s are $S_1, S_2, S_3, \ldots S_m$. If the first term and common difference are 1, 2, 3, ....., m respectively, then $S_1 + S_2 + S_3 + \ldots + S_m$ =

**A.** (¼) mn (m + 1)(n + 1)

**B.** (½) mn (m + 1)(n + 1)

**C.** mn (m + n) (n + 1)

**D.** None of these

The sum of positive terms of the series

$$10 + 9\frac{4}{7} + 9\frac{1}{7} + \ldots$$ is

**A.** 352/7 **B.** 437/7 **C.** 852/7 **D.** None of these

The interior angles of a polygon are in A.P. If the smallest angle is **120°** and the common difference is **5**, then the number of sides of the polygon is

**A.** 16 **B.** 8 **C.** 9 **D.** None of these

If $a_m$ be the $m^{th}$ term of an A.P., then

$$a_1^2 - a_2^2 + a_3^2 - a_4^2 + \ldots + a^2{}_{2n-1} - a_{2n}^2 =$$

**A.** $\dfrac{n-1}{2n-1}(a_1^2 - a_{2n}^2)$

**B.** $\dfrac{n}{2n-1}(a_{2n}^2 - a_1^2)$

**C.** $\dfrac{n}{2n-1}(a_1^2 - a_{2n}^2)$

**D.** None of these

If a is the first term, d the common difference and $S_k$ the sum to k terms of an A.P., then for $S_{kx}/S_x$ to be independent of x

**A.** a = 2d **B.** a = d **C.** 2a = d **D.** None of these

If $a_1, a_2, ...., a_n$ are in A.P. with common difference $d \neq 0$, then the sum of the series $\sin d.[\sec a_1 \sec a_2 + \sec a_2 \sec a_3 + .... \sec a_{n-1} \sec a_n]$ is

**A.** $\operatorname{cosec} a_n - \operatorname{cosec} a_1$

**B.** $\cot a_n - \cot a_1$

**C.** $\sec a_n - \sec a_1$

**D.** $\tan a_n - \tan a_1$

Example

The value of x in $(-\pi, \pi)$ which satisfies the equation $8^{(1+|\cos x|+|\cos^2 x|+|\cos^3 x|+\ldots\infty)} = 4^3$ is

**A.** $\frac{\pi}{3}$ **B.** $-\frac{\pi}{3}$ **C.** $\frac{2\pi}{3}$ **D.** All of these

Example

The sum of 50 terms of the sequence **7, 7.7, 7.77, 7.777, .....** is

**A.** $\frac{8}{81}\left\{4490+\frac{1}{10^{49}}\right\}$

**B.** $\frac{7}{81}\left\{4490+\frac{1}{10^{49}}\right\}$

**C.** $\frac{5}{81}\left\{4490+\frac{1}{10^{49}}\right\}$

**D.** None of these

Example

Sum of the series $(1 + x) + (1 + x + x^2) + (1 + x + x^2 + x^3) + \ldots$ upto n terms

**A.** $\frac{1}{1-x}\left[n - \frac{x^2(1-x^n)}{1-x}\right]$

**B.** $\frac{1}{1-x}\left[n - \frac{x^3(1-x^n)}{1-x}\right]$

**C.** $\frac{1}{1-x}\left[n - \frac{x(1-x^n)}{1-x}\right]$

**D.** None of these

Example

Let $S_n$ denotes the sum of n terms of an A.P. whose first term is a. if the common difference $d = S_n - k S_{n-1} + S_{n-2}$ then k =

**A.** 1 **B.** 2 **C.** 3 **D.** None of these

Example

For $0 < \phi < \pi/2$, if $x = \sum_{n=0}^{\infty} \cos^{2n}\phi$, $y = \sum_{n=0}^{\infty} \sin^{2n}\phi$, $z = \sum_{n=0}^{\infty} \cos^{2n}\phi \sin^{2n}\phi$

**A.** xyz = xz + y

**B.** xyz = xy + z

**C.** xyz = x + y + z

**D.** xyz = yz + x

Example

Three numbers form an increasing GP. if the middle number is doubled, then the new numbers are in A.P. The common ratio of GP. is

**A.** $2 - \sqrt{3}$ **B.** $2 + \sqrt{3}$ **C.** $\sqrt{3} - 2$ **D.** $2$

# #JEELiveDaily Schedule

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## 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

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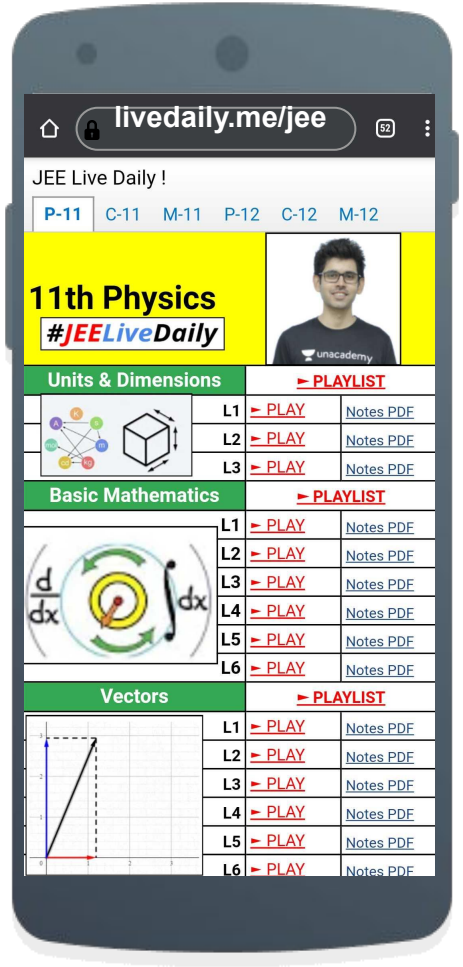


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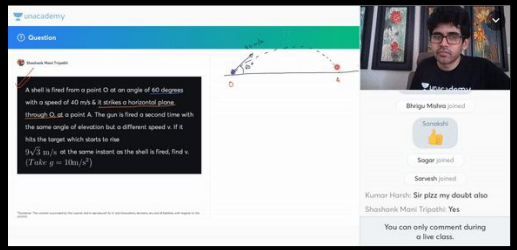


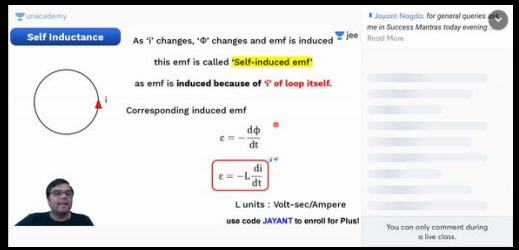


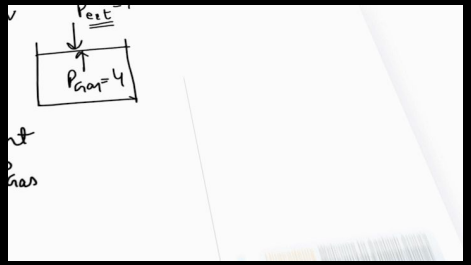

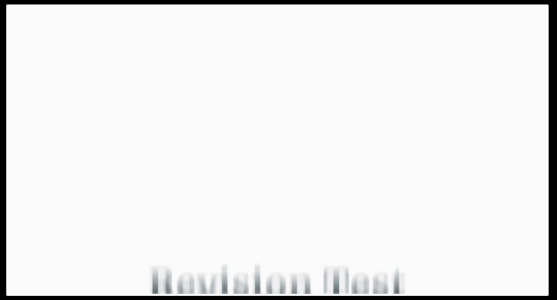


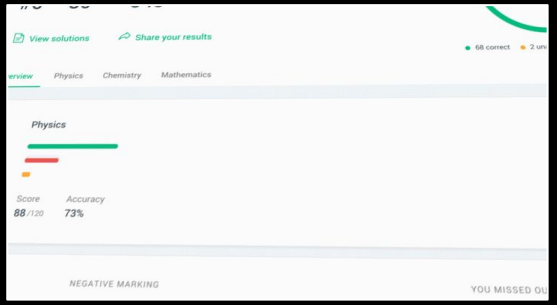


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- **LIVE Doubt** Solving
- **LIVE** Interaction

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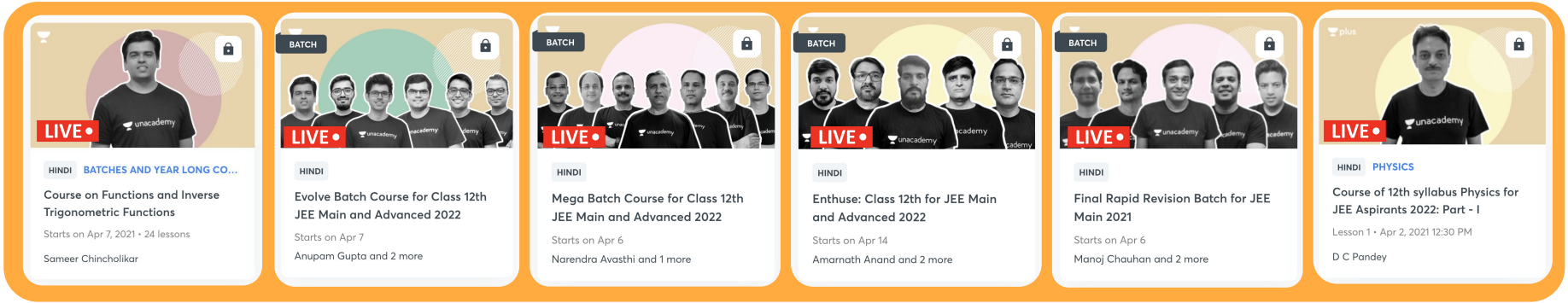


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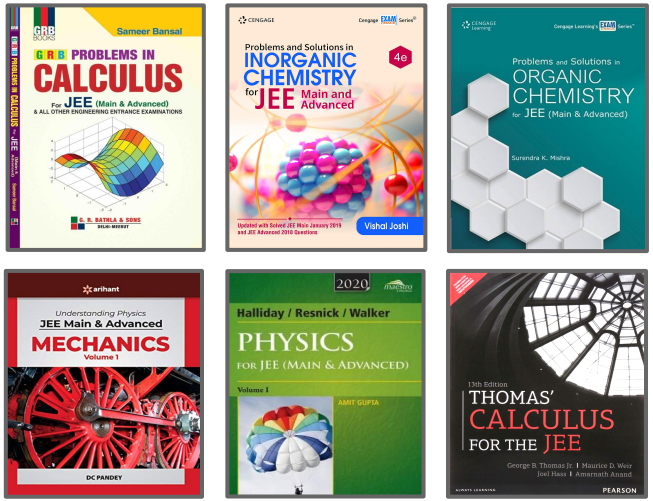

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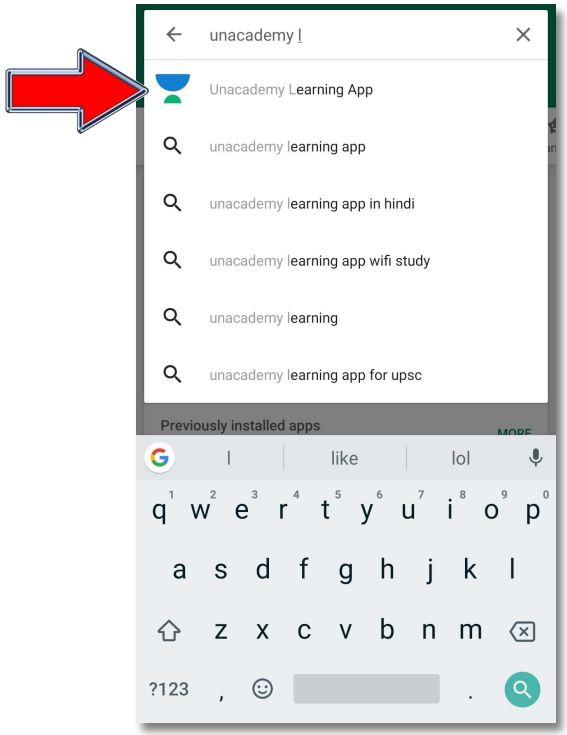
## Step 1

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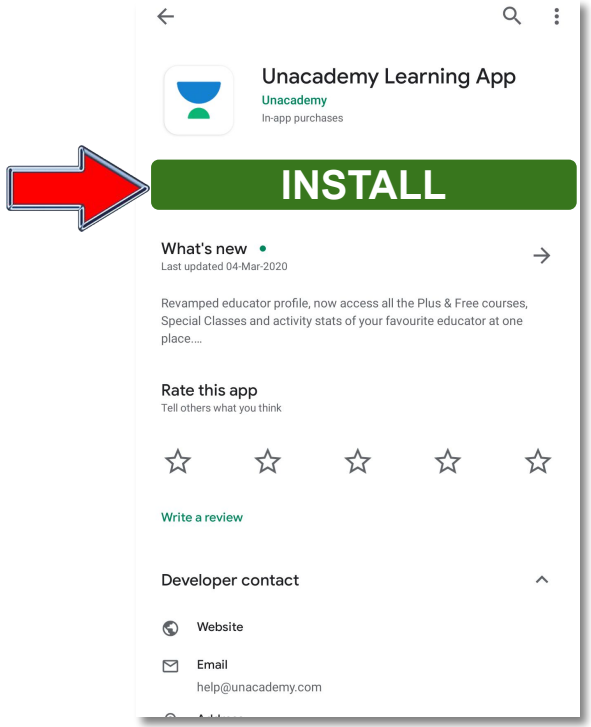

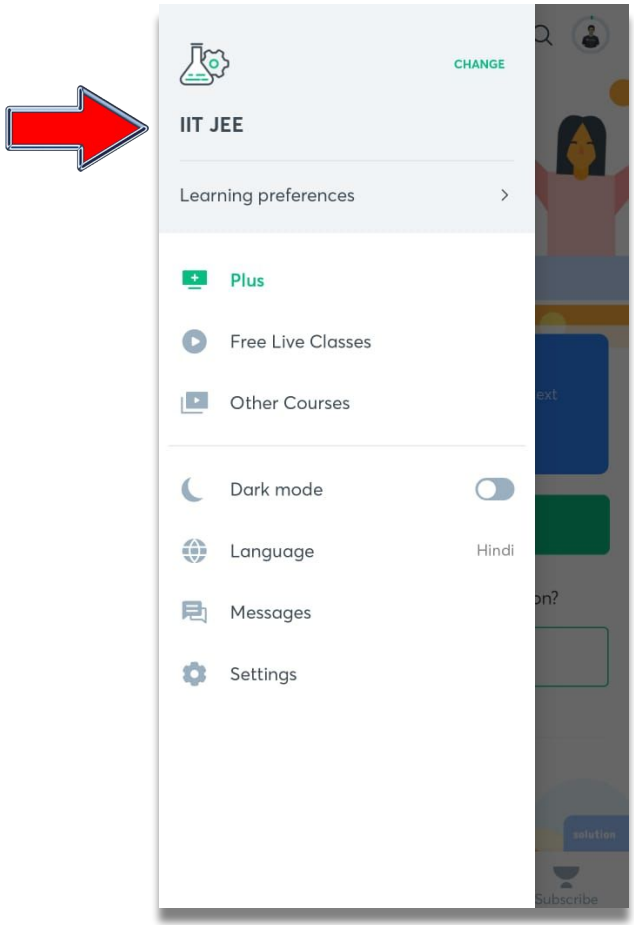
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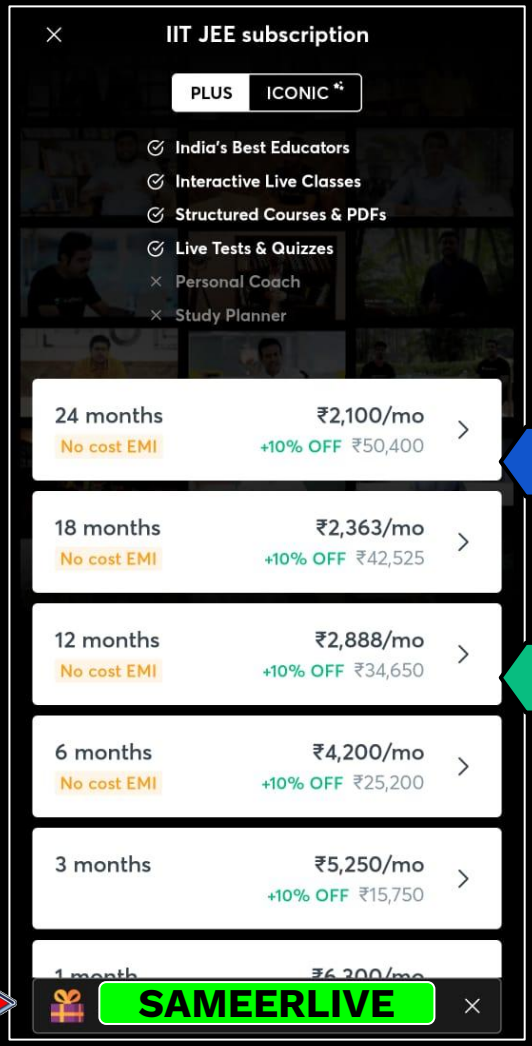


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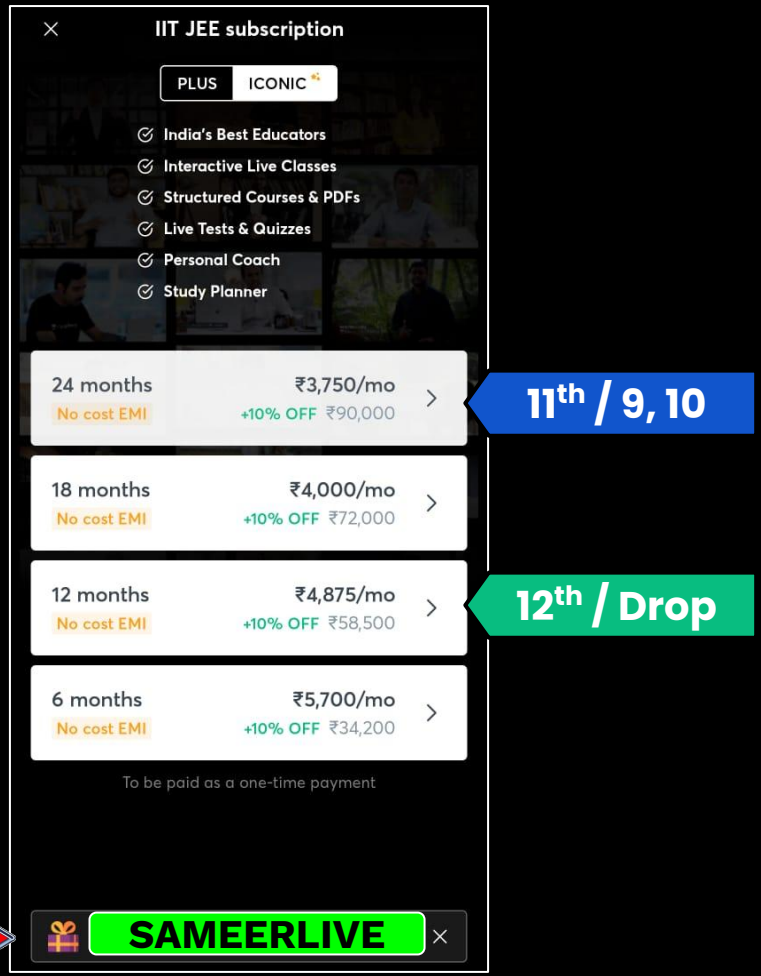


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