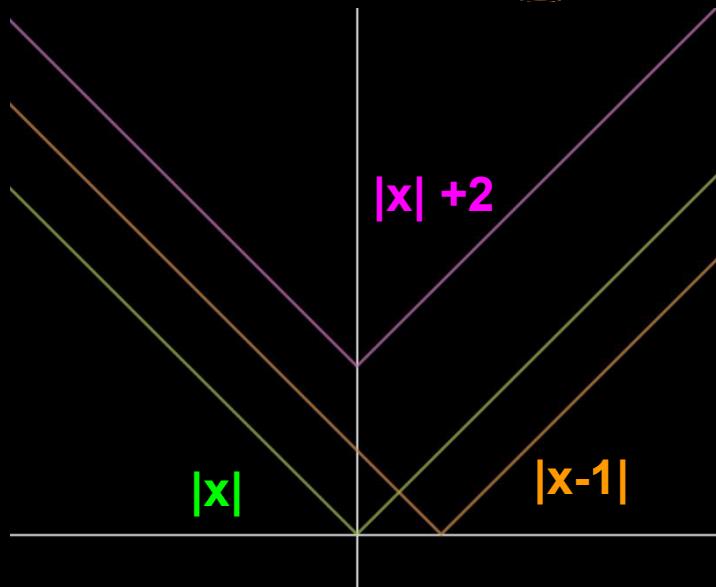


# Functions

DPP 3

Modulus Function





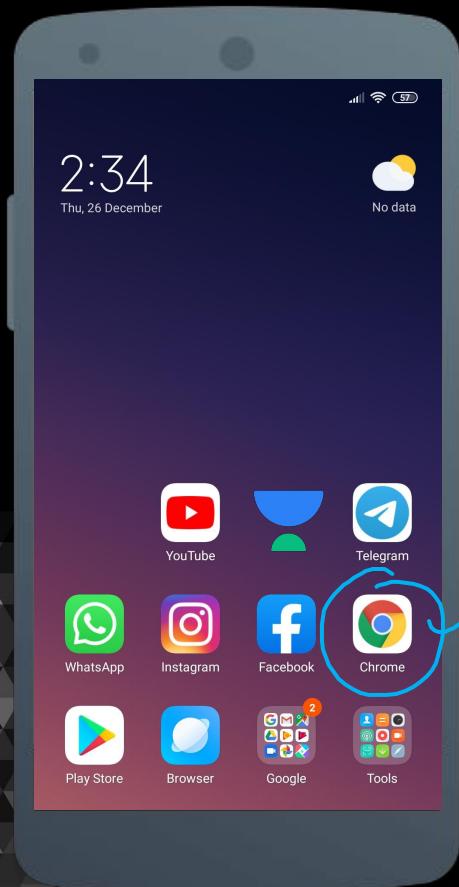
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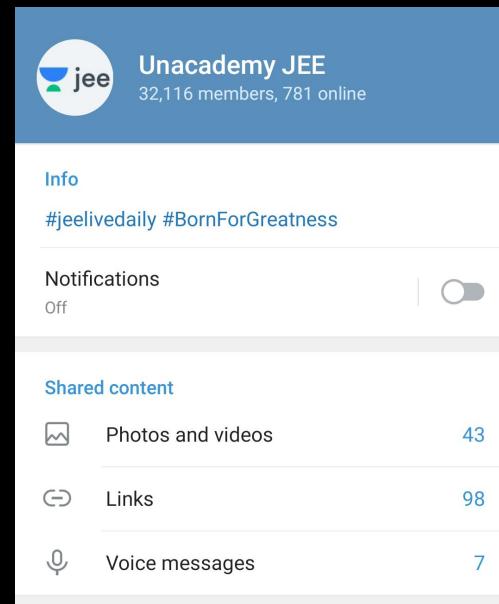
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**B.Tech, M.Tech - IIT-Roorkee**

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# Telegram APP

[tinyurl.com/unacademychat](https://tinyurl.com/unacademychat)



The screenshot shows a Telegram group info page for 'Unacademy JEE'. The group has 32,116 members and 781 online users. It includes sections for Info (with hashtags #jeelivedaily and #BornForGreatness), Notifications (set to Off), and Shared content (Photos and videos: 43, Links: 98, Voice messages: 7).

Shared content	Count
Photos and videos	43
Links	98
Voice messages	7

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1 mo ₹6,000/month

3 mo ₹5,000/month  
₹15,000 ₹15,000 for 3 months

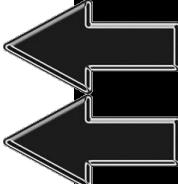
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₹24,000 ₹24,000 for 6 months

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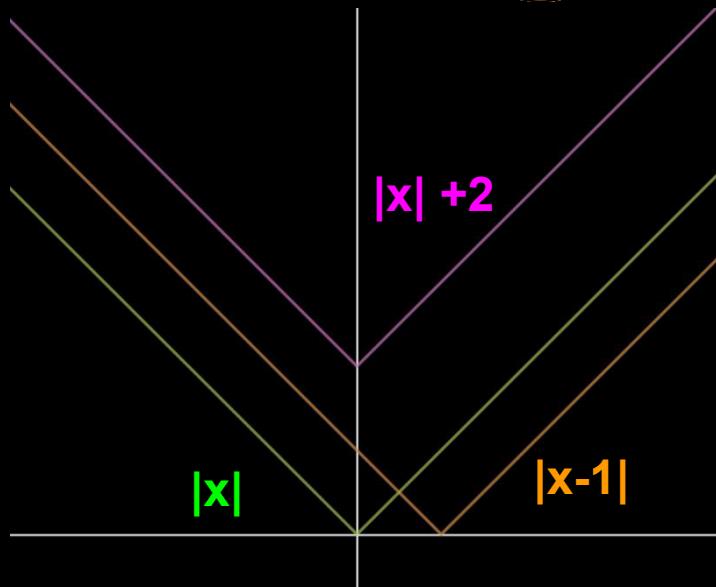


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# Functions

DPP 3

Modulus Function





# Homework Discussion



For  $a \leq 0$ , determine all real roots of the equation  $x^2 - 2a|x - a| - 3a^2 = 0$

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$$[C-1] : \boxed{x > a} \checkmark$$

$$x^2 - 2a(x-a) - 3a^2 = 0$$

$$x^2 - 2ax - a^2 = 0$$

$$x = \frac{2a \pm \sqrt{4a^2 + 4a^2}}{2}$$

$$= a \pm \sqrt{2}a$$

$$\oplus : a + \sqrt{2}a \times$$

$$\ominus : a - \sqrt{2}a \checkmark$$

$$\boxed{C-2} : \boxed{x < a} \checkmark$$

$$x^2 + 2a(x-a) - 3a^2 = 0$$

$$x^2 + 2ax - 5a^2 = 0$$

$$x = \frac{-2a \pm \sqrt{4a^2 + 20a^2}}{2}$$

$$x = -a \pm \sqrt{6}a$$

  $\oplus$   
  $\ominus$

$$\oplus : -a + \sqrt{6}a \checkmark$$

$$\ominus : -a - \sqrt{6}a \times$$

$$\sqrt{a(-1-\sqrt{6})}$$



# Practice Problems

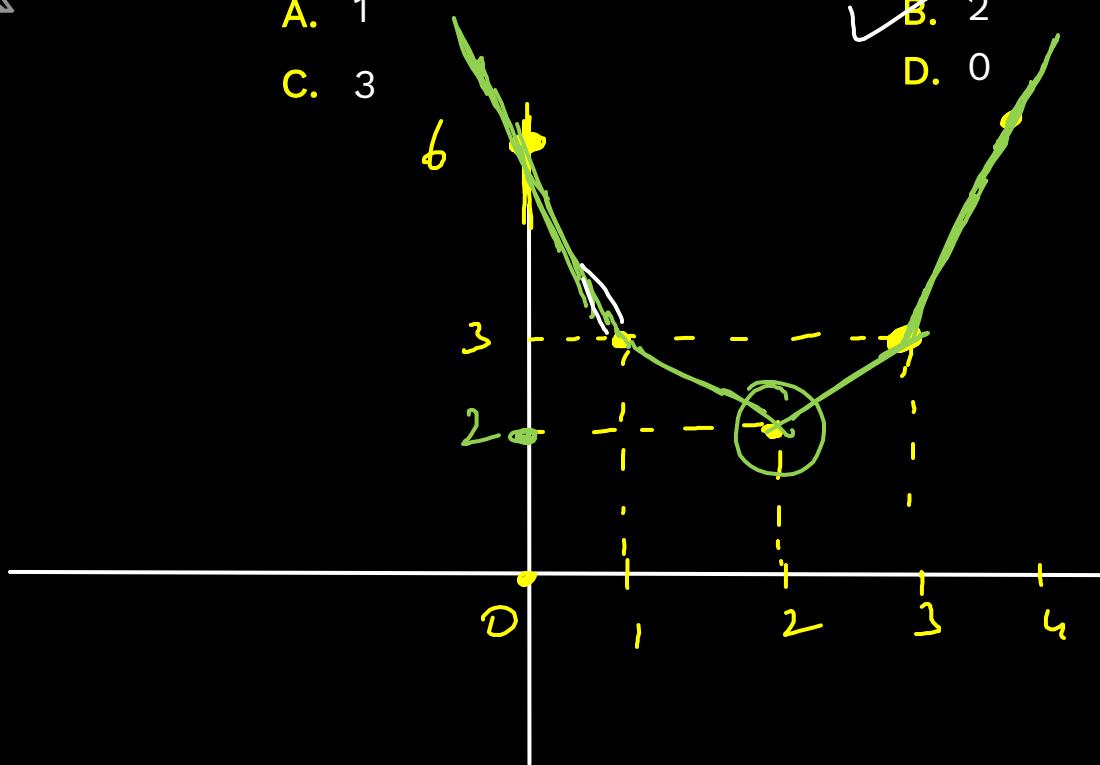


The minimum value of  $f(x) = |x-1| + |x-2| + |x-3|$  is equal to

- A. 1  
C. 3

- B. 2  
D. 0

5



$$f = |x-1| + |x-2| + |x-3|$$

- ↑      ①      ②  
 ①      ↑      ①  
 ②      ①      ↑



The number of solutions of the equation

$$|2x^2 + x - 1| = |x^2 + 4x + 1|$$

A. 1

$\alpha$

C. 3

$\beta$

B. 2

D. 4

5

$$\checkmark \boxed{|a| = |b|} \Rightarrow \boxed{\underline{(a-b)(a+b) = 0}}$$

$$(2n^2+n-1 - n^2 - 4n - 1) (2n^2+n-1 + n^2 + 4n + 1) = 0$$

$$(n^2 - 3n - 2) (3n^2 + 5n) = 0$$

$D_1 > 0$

$D_2 < 0$



$$\left| x + \frac{2}{x} \right| < 3 \quad \text{, then } x \text{ belongs to}$$

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$$\rightarrow \boxed{\underline{|f(n)| < a}}$$

- A.  $(-2, -1) \cup (1, 2)$
- B.  $(-\infty, -2) \cup (-1, 1) \cup (2, \infty)$
- C.  $(-2, 2)$
- D.  $(-3, 3)$

5

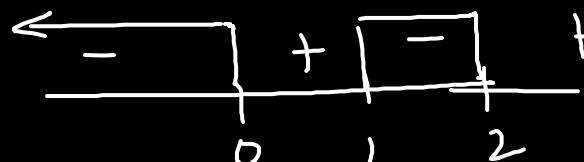
$\boxed{M-1} \therefore$

$\boxed{C-1} \therefore n + \frac{2}{n} < 3$

$$n + \frac{2}{n} - 3 < 0$$

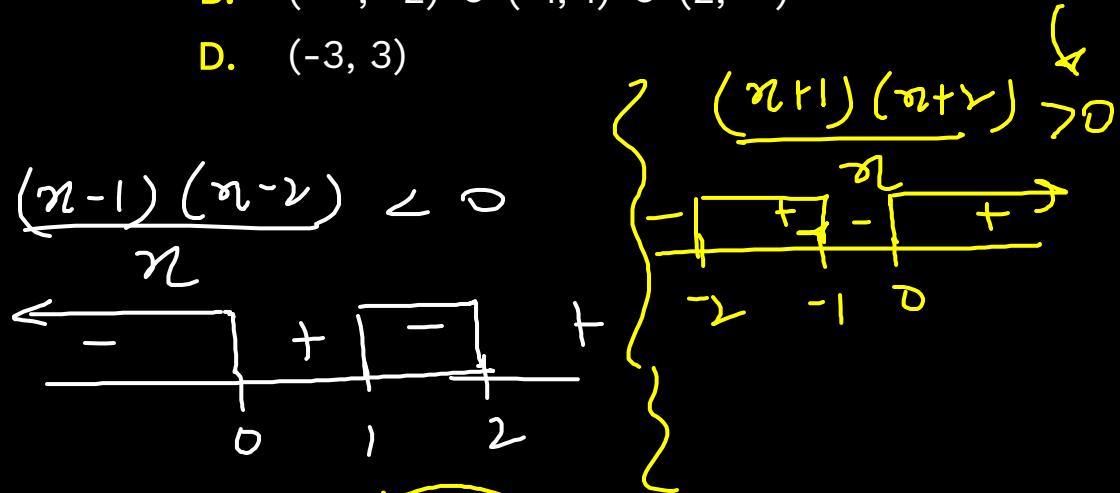
$$\frac{n^2 - 3n + 2}{n} < 0$$

$$\frac{(n-1)(n-2)}{n} < 0$$



$\boxed{C-2} \therefore n + \frac{2}{n} > -3$

$$\frac{n^2 + 3n + 2}{n} > 0$$





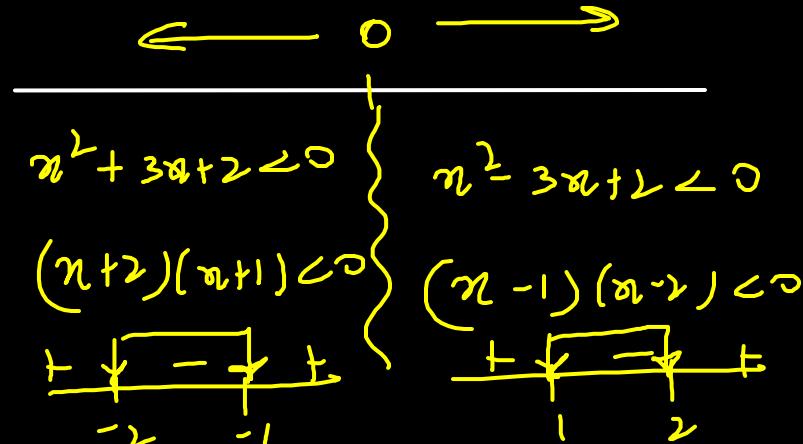
$$n \in (-2, -1) \cup (1, 2)$$

M-2  
 n ≠ 0

$$\therefore \frac{|n^2 + 2|}{|n|} < 3$$

$$n^2 + 2 < 3|n|$$

$$n^2 - 3|n| + 2 < 0$$



$$|n|^2 - 3|n| + 2 < 0$$

M-3



$$\frac{|x+2| - x}{x} < 2$$

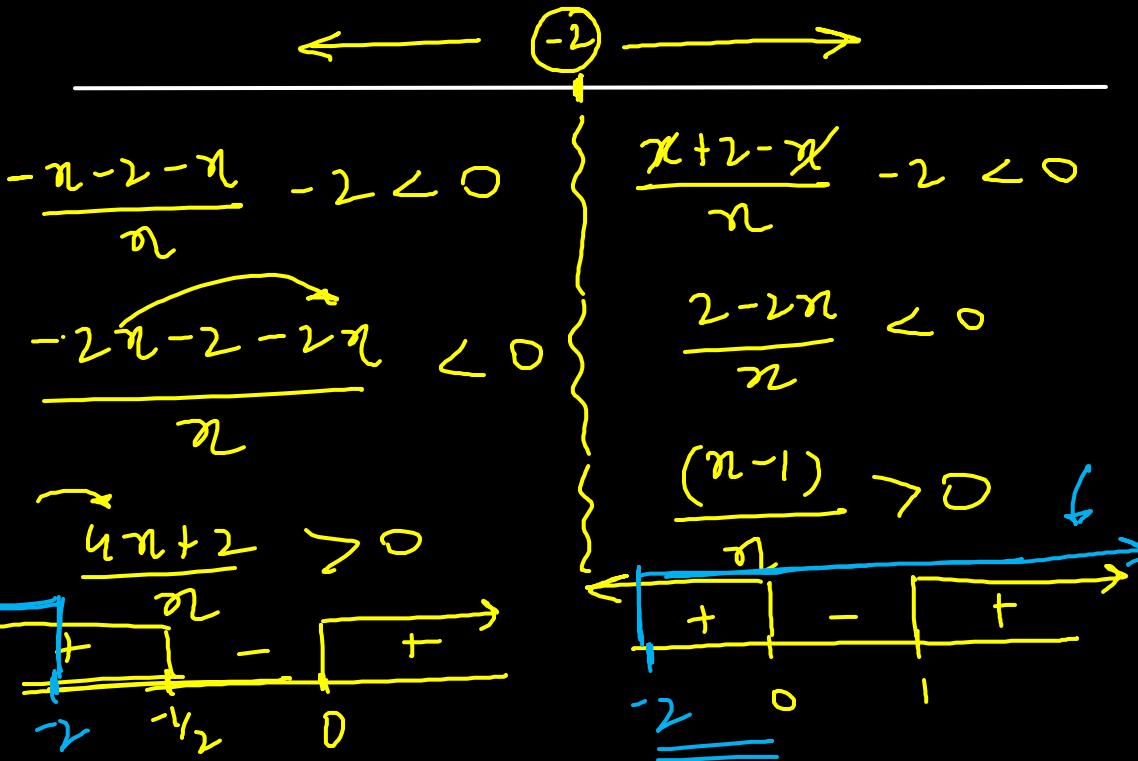
A.  $(-\infty, -2) \cup (1, \infty)$

 B.  $(-\infty, 0) \cup (1, \infty)$

C.  $(-\infty, 0) \cup (2, \infty)$

D.  $(-\infty, -2) \cup (1, +\infty)$

5





Set of values of  $x$  satisfying  $\frac{|x|-1}{|x|+2} > 0$ ,

A.  $(-\infty, -2) \cup (2, \infty)$

B.  $(-2, -1] \cup [1, 2)$

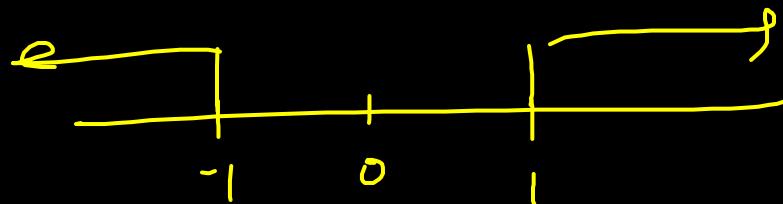
C.  $(-\infty, -1) \cup (1, \infty)$

D.  $(-2, 2)$

5

$$|x| - 1 > 0$$

$$\left\{ \begin{array}{l} |x| > 1 \\ \end{array} \right.$$

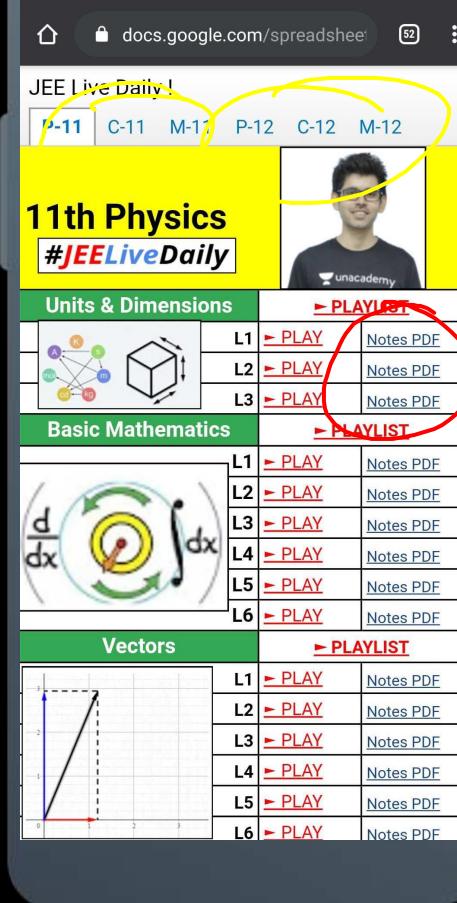




\* Solve for x:  $||2x - 1| - 4| \leq 2$



# tinyurl.com/jemobile



# MON - WED

11<sup>th</sup>  **jee LIVE daily 2.0**

7 PM Namo Sir Physics



12<sup>th</sup>  **jee LIVE quiz 2.0**

8 PM Paaras Sir Chemistry



9 PM Sameer Sir Maths



4 PM Nishant Sir Maths



5 PM Anupam Sir Chemistry



6 PM Jayant Sir Physics



# THURS - SAT

12<sup>th</sup> 

7 PM Jayant Sir Physics



11<sup>th</sup> 

4 PM Sameer Sir Maths



8 PM Anupam Sir Chemistry



5 PM Paaras Sir Chemistry



9 PM Nishant Sir Maths



6 PM Namo Sir Physics



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The screenshot shows a chemistry question from Unacademy. The question asks to identify the major product 'X' in a reaction between 4-nitrophenylhydrazine and 2,4-dinitrophenol. A handwritten note on the right side of the screen shows the mechanism: an  $\text{NO}_2^+$  cation attacking the oxygen of a phenoxide ion ( $\text{O}^-$ ) in the 2,4-dinitrophenol molecule, which is labeled as 'e<sup>-</sup> rich system'. The product is shown as a 2,4-dinitrophenylhydrazone derivative. The Unacademy interface includes a sidebar with user interactions and a list of participants.

The screenshot shows a test results summary for a Physics test. The user scored 88/120 with an accuracy of 73%. The interface also indicates 'NEGATIVE MARKING' and shows a progress bar for the test. The Unacademy interface includes a sidebar with user interactions and a list of participants.



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D C Pandey

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Question

ROHIT SACHAN:

Sir please solve the one more doubt...

16. In the following reaction,  $\text{NO}_2$  reacts with  $\text{H}_2\text{SO}_4$  to form  $\text{NO}_2\text{SO}_3\text{H}$ . The structure of the major product 'X' is -

$\text{NO}_2^+$  → attacks on  $\epsilon$  rich system

$\text{NO}_2$  →  $\text{NO}_2\text{SO}_3\text{H}$

Chaudhuri nitration

Rohit Sachan Sir B aa rha mera

Sirjan Dutta Chaudhuri right

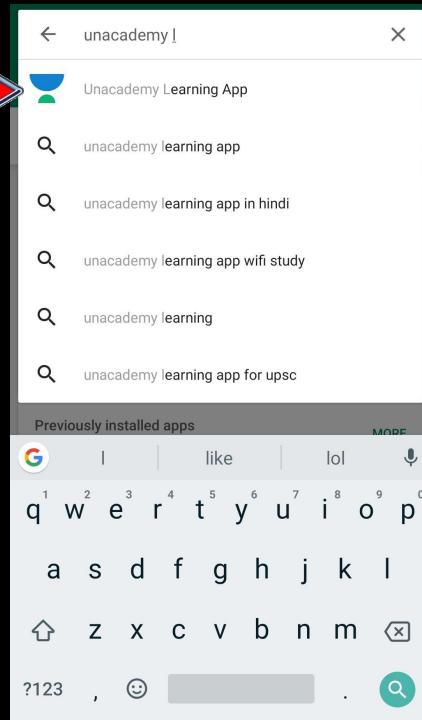
Shoaib Alam Left

Vsvsgsg Right

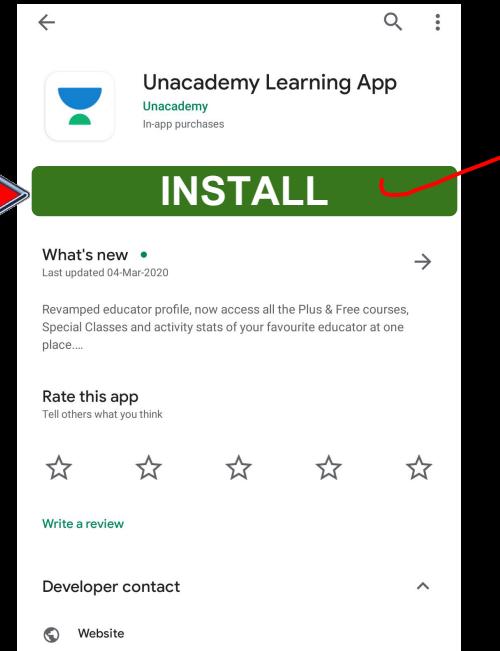
Prashant Singh joined

Rohit Sachan Left

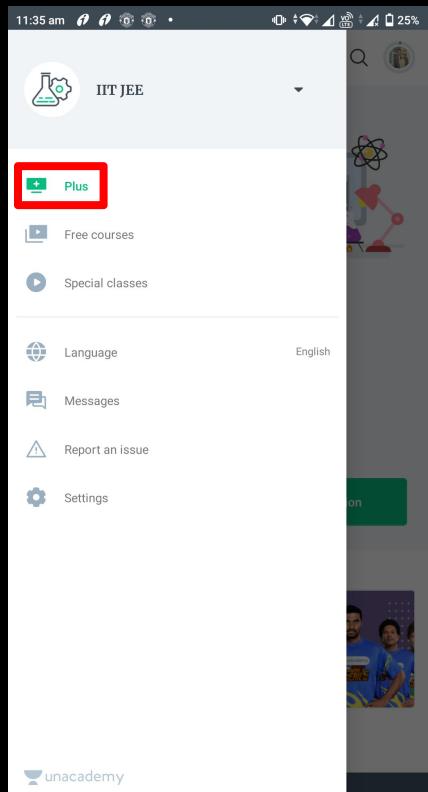
# Step 1



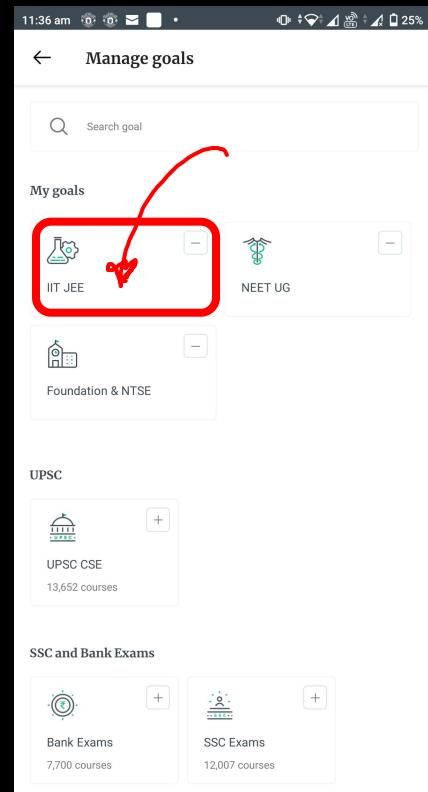
# Step 2



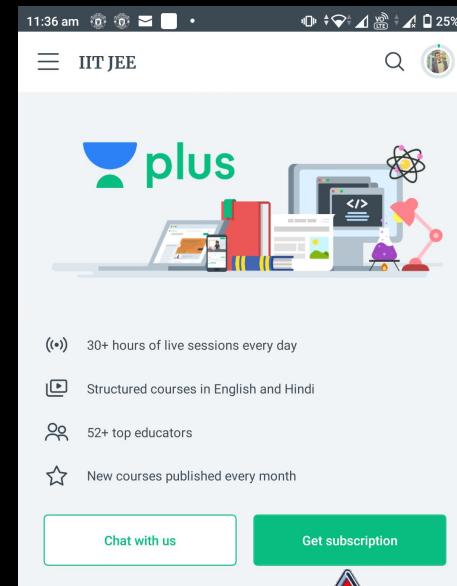
## Step 3



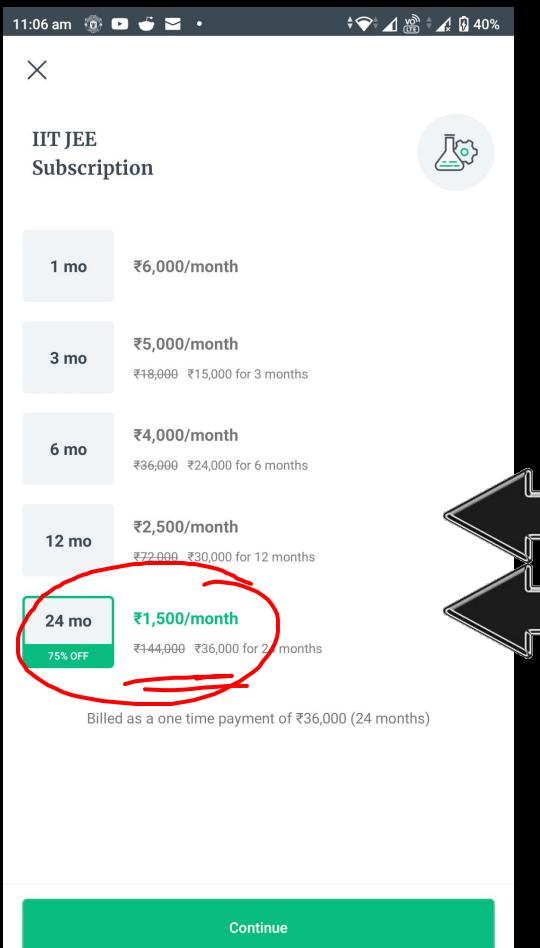
## Step 4



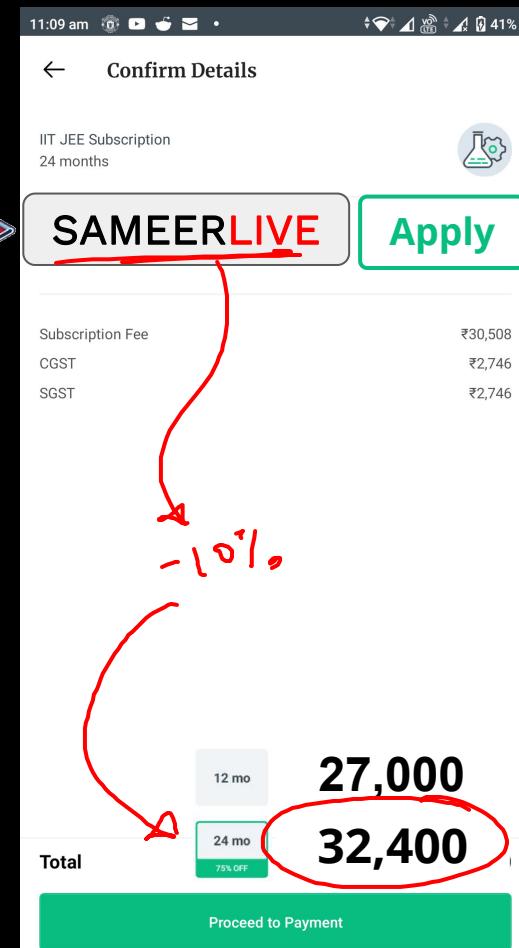
## Step 5



# Step 6



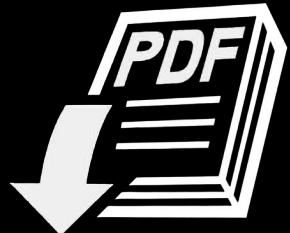
# Step 7



135/-



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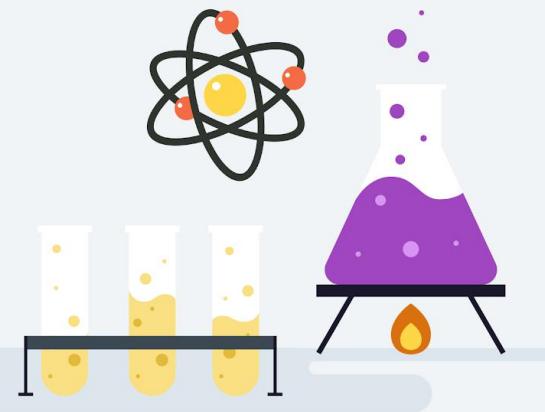




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