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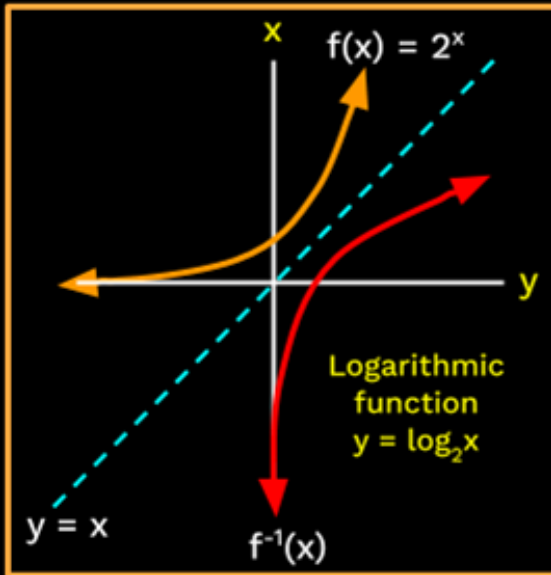
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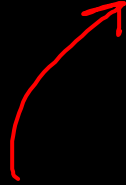
# Functions

DPP

7



# jee **LIVE** quiz **2.0**



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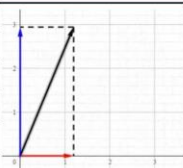
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**Basic Mathematics** ▶ **PLAYLIST**

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**Question**

ROHIT SACHAN: Sir please solve the one more doubt...

16. In the following reaction, c1ccc(cc1)N reacts with c1ccc(cc1)[N+](=O)[O-] to form the major product 'W'.

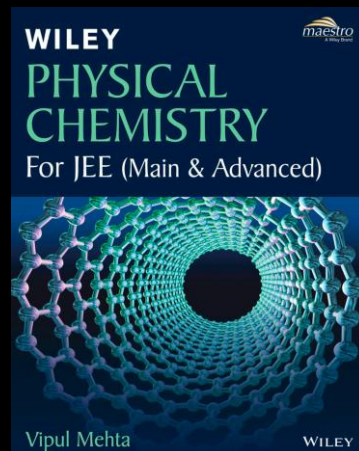
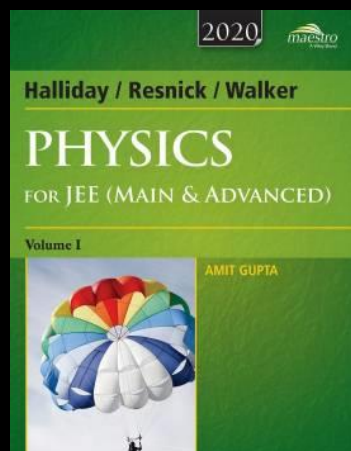
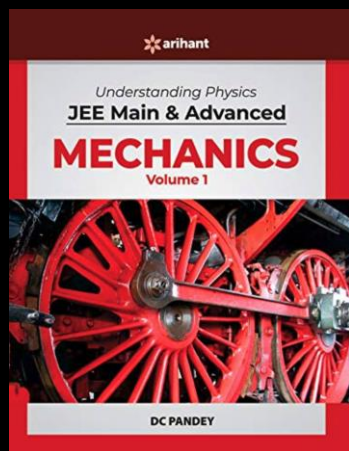
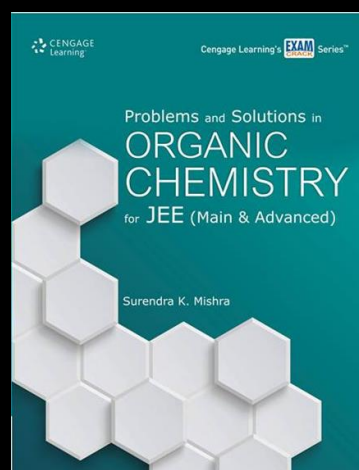
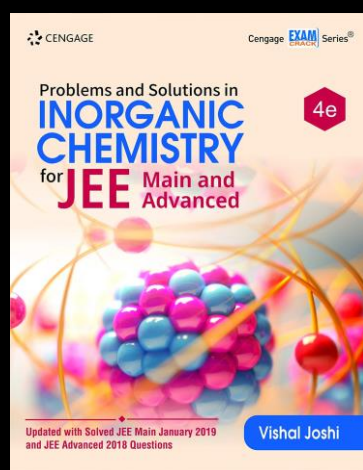
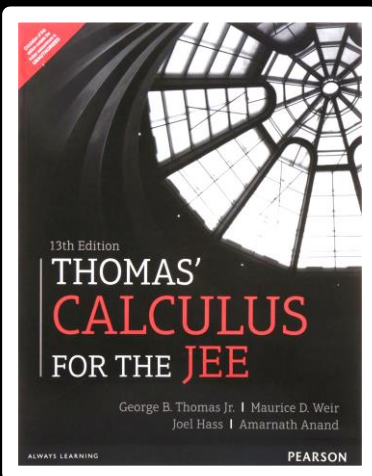
Handwritten solution:

c1ccc(cc1)[N+](=O)[O-] (Electrophile,  $E^+$ ) attacks on  $\epsilon$  rich system (Nucleophile,  $\epsilon^-$  deficient).

Reaction: c1ccc(cc1)N + c1ccc(cc1)[N+](=O)[O-] \xrightarrow{HNO\_3/H\_2SO\_4} \text{Product}

Participants:

- Chaudhuri nitrAtion
- Rohit Sachan Sir B aa rha mera
- Sinchan Dutta Chaudhuri right
- Shoalb Alam Left
- Vsvsgsg Right
- Prashant Singh joined
- Rohit Sachan Left



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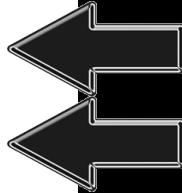
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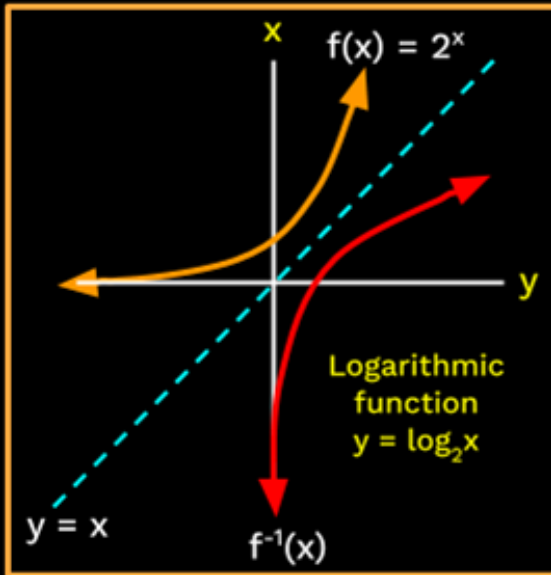
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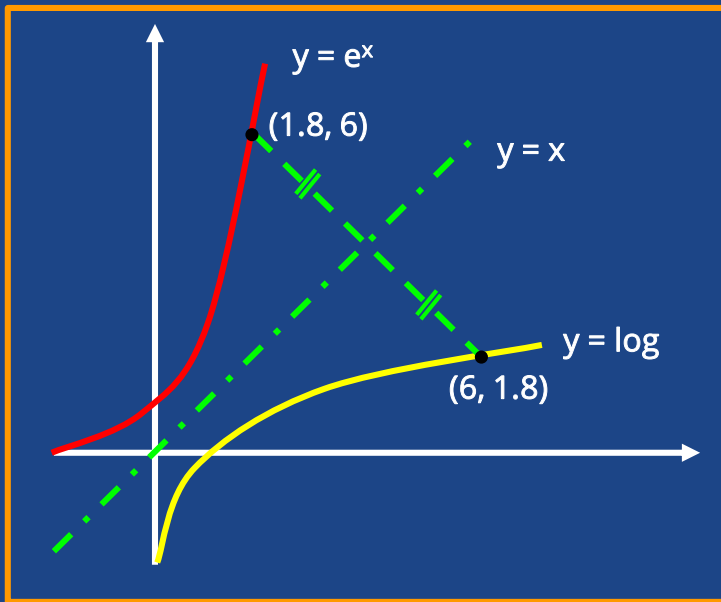
# Functions

DPP

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# Homework Question (DPP-6)





$$\log_{(x+6)} \left( \log_2 \left( \frac{x+2}{x-1} \right) \right) > 0$$

Domain:

$$\textcircled{1} \left( \frac{x+2}{x-1} \right) > 0$$

Case: 1  $\rightarrow (x+6) > 1 ; \boxed{x > -5}$

$$\textcircled{2} \log_2 \left( \frac{x+2}{x-1} \right) > 0$$

$$\log_2 \left( \frac{x+2}{x-1} \right) > \underline{(x+6)^0}$$

$$\textcircled{3} (x+6) > 0$$

$$x+6 \neq 1$$

$$\log_2 \left( \frac{x+2}{x-1} \right) > 1$$

$$\left( \frac{x+2}{x-1} \right) > 2$$

$$\left\{ \frac{x+2}{x-1} > 2 \right.$$

$$\frac{x+2}{x-1} - 2 > 0$$

$$\frac{x+2-2x+2}{x-1} > 0$$

$$\frac{4-x}{x-1} < 0$$

$$\frac{x-4}{x-1} < 0$$

$$\begin{array}{c} + \quad | \quad - \quad | \quad + \\ \hline \quad 1 \quad \quad 4 \end{array}$$

$$\boxed{x \in (1, 4)} \checkmark$$

↳ Case: 2 :  $0 < x+6 < 1 \rightarrow \boxed{-6 < x < -5}$  ← jee

$$0 < \log_2 \left( \frac{x+2}{x-1} \right) < (x+6)^0$$

$$0 < \log_2 \left( \frac{x+2}{x-1} \right) < 1$$

$$\boxed{1 < \left( \frac{x+2}{x-1} \right) < 2}$$

Part-1 :  $\frac{x+2}{x-1} > 1$  Part-2 :  $\frac{x+2}{x-1} - 2 < 0$

$\frac{x+2}{x-1} > 1$

$\frac{x+2 - x+1}{x-1} > 0$

$\frac{3}{x-1} > 0$

$\Rightarrow \boxed{x > 1}$

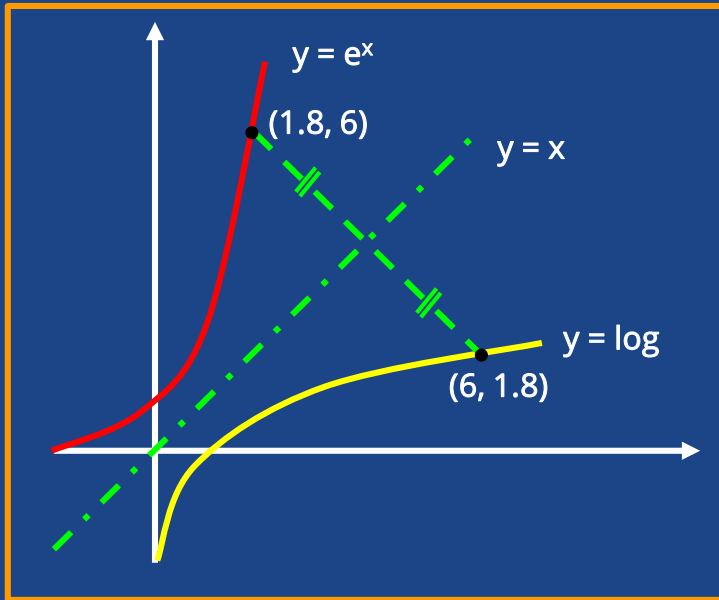
$\frac{x+2 - 2x+2}{x-1} < 0$

$\frac{x-4}{x-1} > 0$

Sign chart for  $\frac{x-4}{x-1}$ :

+	-	+
1	4	

# Homework Question (L-10)



# Example

If  $y = 3[x] + 2 = 2[x + 4]$ . Find the value of:  $[x + y]$ .

A.

26

B.

20

C.

14

D.

None

$$3[x] + 2 = 2[x + 4]$$

$$3[x] + 2 = 2([x] + 4)$$

$$3[x] + 2 = 2[x] + 8$$

$$[x] = 6$$

$$\Rightarrow [x \in [6, 7)]$$

$$y = 3[x] + 2$$

$$= 3(6) + 2 = 20$$

Now!

$$[x + y]$$

$$= [x + 20]$$

$$= [x] + 20 = 26$$



# Example

$y = [2x - 1] = 3[x - 6]$ . Find the possible values of  $[3x + y]$ .

A. 84

B. 85

C. 103

D. 104

$$[2x - 1] = 3[x - 6]$$

$$[2x] - 1 = 3[x] - 18$$

$$x = \underline{\underline{I}} + b = \underline{\underline{[x]}} + \{x\}$$

$$[2(I + b)] - 1 = 3I - 18$$

$$\begin{aligned} 2I + [2b] - 1 &= 3I - 18 \\ [2b] &= I - 17 \end{aligned} \quad \text{--- (1)}$$



Case-1:  $f \in [0, 0.5)$

$$2f \in [0, 1)$$

$$\lfloor 2f \rfloor = 0$$

Ans<sup>n</sup> ①:

$$0 = I - 17$$

$$I = 17$$

$$\left. \begin{array}{l} x = I + f : x \in [17, 17.5) \\ y = 3 \lfloor x - 6 \rfloor = 3 \lfloor x \rfloor - 18 \\ = 3 \times 17 - 18 = 33 \end{array} \right\}$$

Now:

$$\left. \begin{array}{l} \lfloor 3x + y \rfloor = \lfloor 3x \rfloor + 33 \\ \therefore x \in [17, 17.5) \end{array} \right\}$$

$$3x \in [51, 52.5)$$

$$\left. \begin{array}{l} \lfloor 3x \rfloor \rightarrow 51 \\ \lfloor 3x \rfloor \rightarrow 52 \end{array} \right\}$$

$$51 + 33 = 84$$

$$52 + 33 = 85$$





Case 2:  $f \in [0.5, 1)$

$2f \in [1, 2)$

$[2f] = 1$

In eqn (i):

$1 = I - 17$

$I = \textcircled{18}$  ✓

$x = I + f ; x \in [18.5, 19)$

$y = 3[x] - 18 = 3 \times 18 - 18 = \textcircled{36}$

Now:

$[3x + y] = [3x] + 36$

$\because x \in [18.5, 19)$

$3x \in [55.5, 57)$

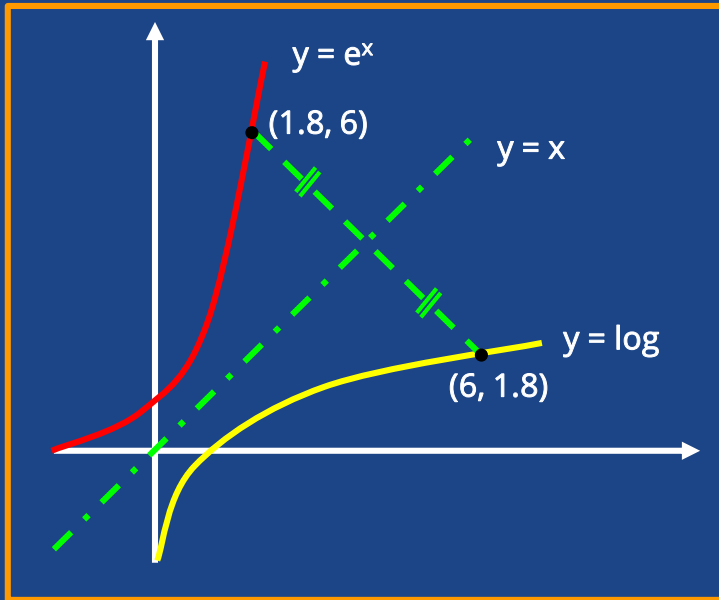
$[3x] \rightarrow \textcircled{55}$   
 $\rightarrow \textcircled{56}$  ✓

$55 + 36 = \textcircled{91}$

$56 + 36 = \textcircled{92}$



# Homework Question (L-11)



# Example

Find the number of solutions of the equation:  $\text{sgn}(x^2 - 3x + 2) = (2x - 1)$

A. 1

B. 2

C. 3

☒ D. 0

Case 1:  
 $(x^2 - 3x + 2) > 0$

$1 = 2x - 1$

$x = 1$

X

Case 2:  
 $(x^2 - 3x + 2) = 0$

$0 = 2x - 1$

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

X

Case 3:  
 $(x^2 - 3x + 2) < 0$

$-1 = 2x - 1$

$x = 0$

X



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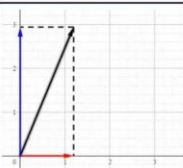
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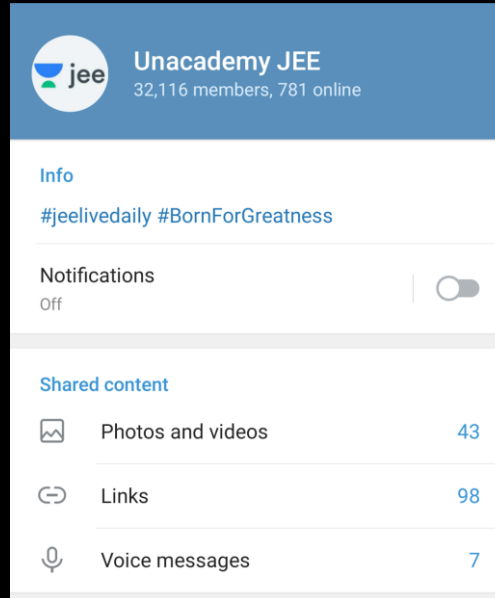
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The screenshot displays a live session interface on the Unacademy platform. At the top, the Unacademy logo is visible. Below it, a question is posed by Rohit Sachan: "Sir please solve the one more doubt...". The question text is partially obscured by a chemical reaction diagram. The diagram shows the reaction of aniline with  $\text{HNO}_3/\text{H}_2\text{SO}_4$ . Handwritten notes in red ink show the mechanism: aniline reacts with  $\text{HNO}_3/\text{H}_2\text{SO}_4$  to form a nitronium ion ( $\text{NO}_2^+$ ). The nitronium ion then attacks the nitrogen atom of the aniline ring, which is labeled as an "e<sup>-</sup> rich system". The resulting intermediate is shown with a positive charge on the nitrogen atom. The reaction is labeled as "e<sup>-</sup> deficient".

On the right side of the interface, there is a video feed of the educator, Rohit Sachan, and a list of participants. The participants listed are Chaudhuri nitrATion, Rohit Sachan Sir B aa rha mera, Sinchan Dutta Chaudhuri right, Shoaib Alam Left, Vsvsgs Right, Prashant Singh joined, and Rohit Sachan Left.

The screenshot shows a test series analysis dashboard. At the top, there are buttons for "View solutions" and "Share your results". Below these buttons, there is a progress bar indicating the status of the test series. The progress bar shows a score of 88/120 and an accuracy of 73%. The dashboard also displays a table with the following data:

Score	Accuracy
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At the bottom of the dashboard, there is a section for "NEGATIVE MARKING" and a note that says "YOU MISSED OUT".



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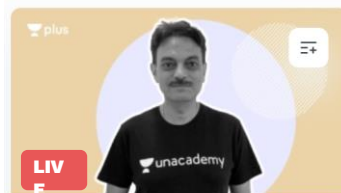
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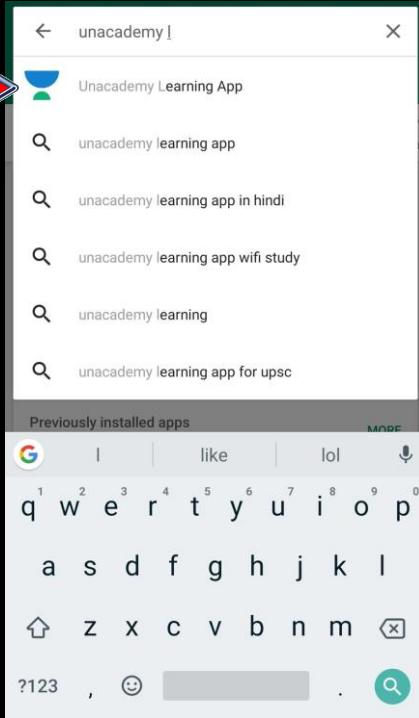
ROHIT SACHAN:  
Sir please solve the one more doubt...

16. In the following reaction, the structure of the major product 'X' is

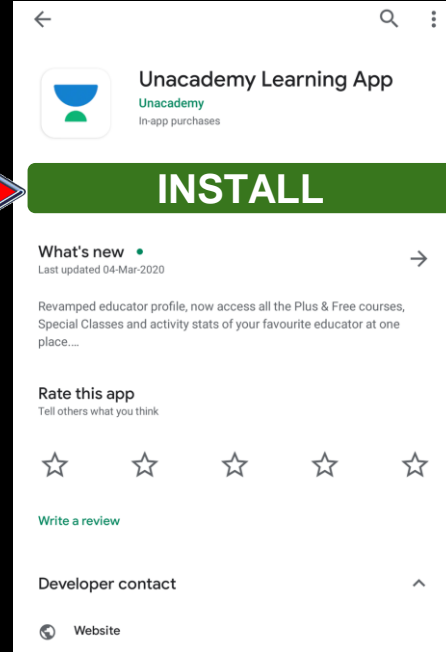
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c1ccccc1N +  $\text{HNO}_3/\text{H}_2\text{SO}_4$  → c1ccccc1[N+](=O)[O-] (e-deficient)  
 $\text{NO}_2^+$  attacks on e rich system

Participants:  
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Rohit Sachan Sir Baa rha mera  
Sinchan Dutta Choudhuri right  
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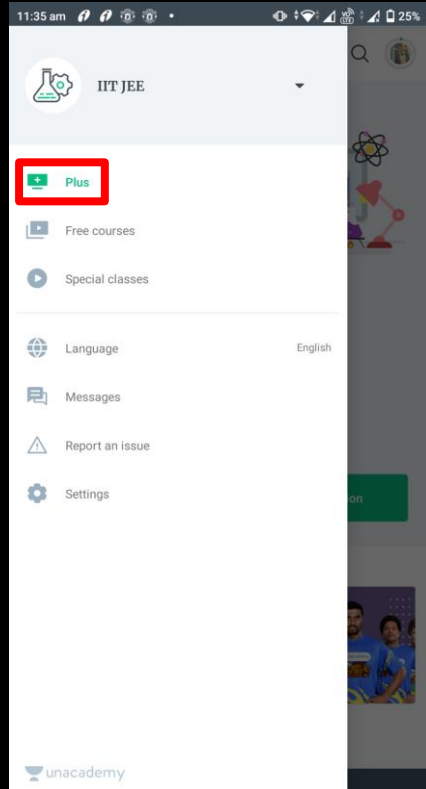
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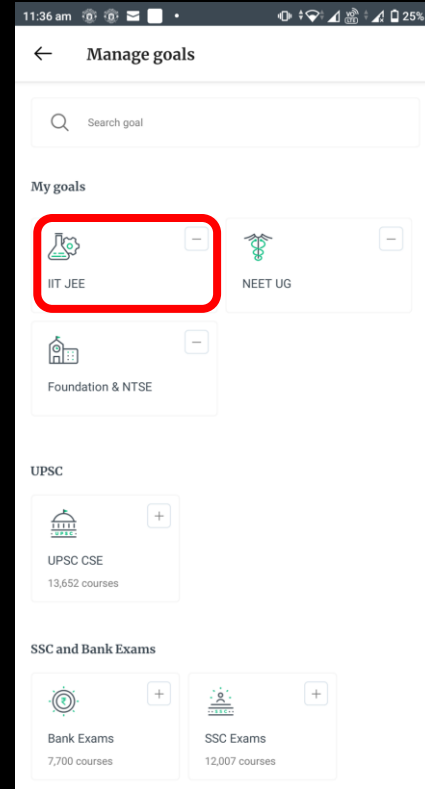
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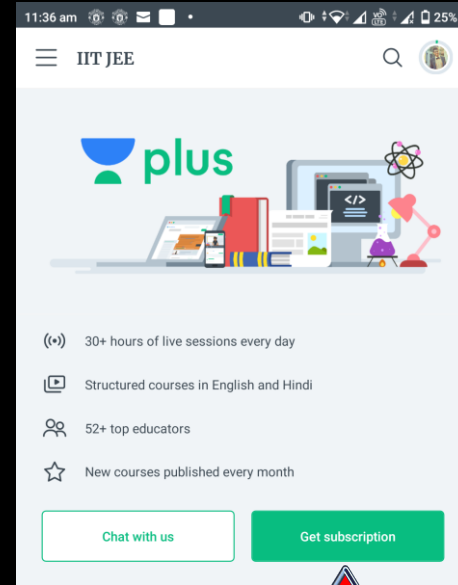
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