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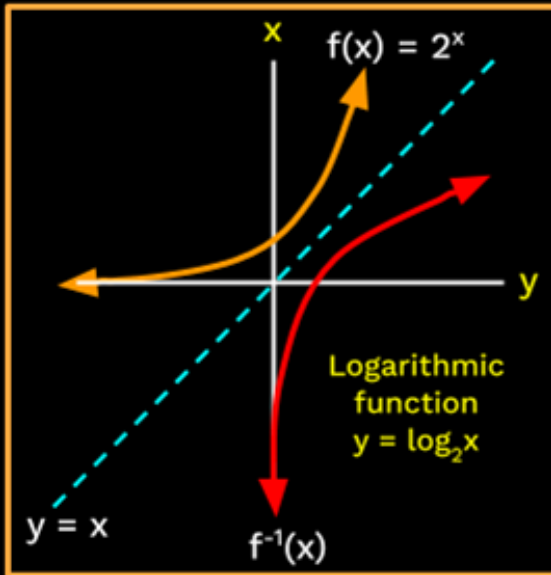
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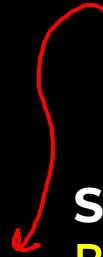
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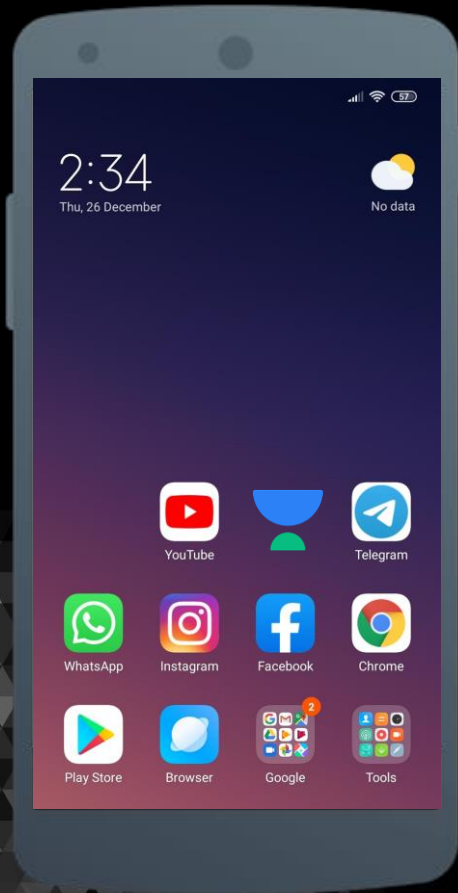
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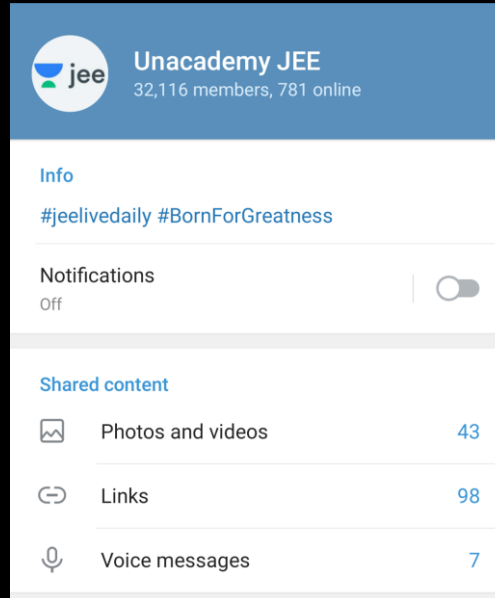


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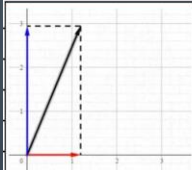
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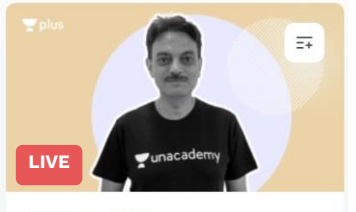
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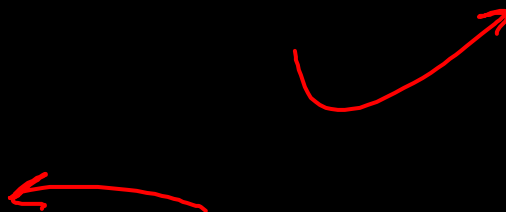
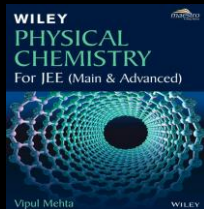
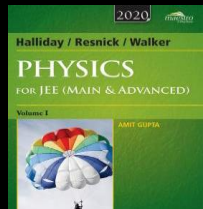
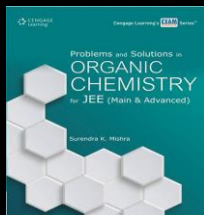
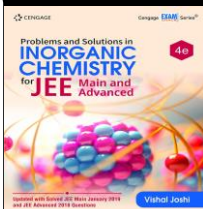
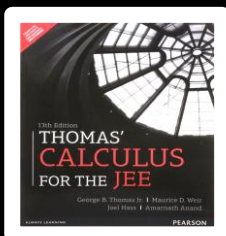
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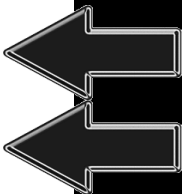
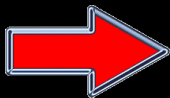
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Solve for x:

$$\left(\frac{1}{5}\right)^{\frac{|x+2|}{2-|x|}} > 25$$

$$\Rightarrow (5)^{\frac{|x+2|}{|x|-2}} > (5)^{(2)}$$

A. $(2, 6)$

B. $(2, \infty)$

C. $(-6, -2) \cup (2, 6)$

D. $(-6, -2)$

5

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

 $\left\{ \right.$

$$\frac{|x+2| - 2|x| + 4}{|x|-2} > 0$$

$$\frac{|(x+2)|}{|x|-2} - 2 > 0$$

 $\left\{ \right.$

$\leftarrow -2 \rightarrow$
 $0 \rightarrow$

$$\frac{-(x+2) + 2x + 4}{-x-2} > 0$$

$$\frac{(x+2)}{-(x+2)} > 0$$

$$\boxed{-1 > 0}$$

X

$$\frac{(x+2) + 2x + 4}{-x-2} > 0$$

$$\frac{3x+6}{-(x+2)} > 0$$

$$\frac{3(\cancel{x+2})}{-(\cancel{x+2})} > 0$$

$$\boxed{-3 > 0}$$

X

$$\frac{(x+2) - 2(x) + 4}{x-2} > 0$$

$$\frac{-x+6}{x-2} > 0$$

$$\frac{x-6}{x-2} < 0$$

$$\begin{array}{c} + \quad - \quad + \\ \hline \begin{array}{cc} 2 & 6 \end{array} \end{array}$$

$$\boxed{x \in (2, 6)}$$



Solve of $2^x + 2^{|x|} \geq 2\sqrt{2}$

A. $(-\infty, \log_2(\sqrt{2} + 1))$

B. $(0, \infty)$ ✗

C. $(\frac{1}{2}, \log_2(\sqrt{2} - 1))$ ✗

✓ D. $(-\infty, \log_2(\sqrt{2} - 1)] \cup [\frac{1}{2}, \infty)$

Case-1 : $x \geq 0$

$$2^x + 2^x \geq 2\sqrt{2}$$

$$2 \cdot (2^x) \geq 2\sqrt{2}$$

$$\log_2(2^x) \geq \log_2(\sqrt{2})$$

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

* Case-2: $x < 0$

$$2^x + 2^{-x} \geq 2\sqrt{2}$$

$$2^x + \frac{1}{2^x} \geq 2\sqrt{2}$$

Let: $2^x = t > 0$

$$t + \frac{1}{t} \geq 2\sqrt{2}$$

$$t^2 + 1 \geq 2\sqrt{2}t$$

$$t^2 - 2\sqrt{2}t + 1 \geq 0 \quad \text{--- (1)}$$

Looking $t^2 - 2\sqrt{2}t + 1 = 0$

$$t = \frac{2\sqrt{2} \pm \sqrt{8-4}}{2}$$

$$t = \frac{2\sqrt{2} \pm 2}{2}$$

$$t = \sqrt{2} \pm 1 \quad \begin{matrix} \nearrow \alpha = (\sqrt{2}-1) \\ \searrow \beta = (\sqrt{2}+1) \end{matrix}$$

Ex: $x^2 - 5x + 6 = (x - 2)(x - 3)$

Diagram showing the factorization process: $x^2 - 5x + 6 = (x - 2)(x - 3)$. The roots are $\alpha = 2$ and $\beta = 3$.

Sign chart for $(t - \alpha)(t - \beta) \geq 0$:

Number line with points α and β . The sign is positive ($+$) for $t < \alpha$ and $t > \beta$, and negative ($-$) for $\alpha < t < \beta$.

Solution set: $t \in (-\infty, \alpha] \cup [\beta, \infty)$

Logarithmic inequalities:

- Case 1: $2^x \leq (\sqrt{2} - 1)$ $\Rightarrow x \leq \log_2(\sqrt{2} - 1)$ $\rightarrow (-)$
- Case 2: $2^x \geq (\sqrt{2} + 1)$ $\Rightarrow x \geq \log_2(\sqrt{2} + 1)$ $\rightarrow (+)$



⊕
If $\sqrt{2^{2x}-7} < 2^x - 1$, then complete set of values of x is

A. $(3, \log_2 7]$

B. $[\log_4 7, \log_2 7]$

✓ C. $[\log_4 7, 2)$

D. None of these

5

Domain:

$$2^{2x} - 7 \geq 0$$

$$4^x \geq 7$$

$$\boxed{x \geq \log_4 7}$$

Case: $2^x - 1 \geq 0 \Rightarrow 2^x \geq 1 \Rightarrow \boxed{x \geq 0}$

On squaring:

$$2^{2x} - 7 < (2^x - 1)^2$$

$$\cancel{2^{2x}} - 7 < \cancel{2^{2x}} - 2 \cdot 2^x + 1$$

$$2 \cdot 2^x < 8$$

$$2^x < 4$$



$$x < 2 \quad \checkmark$$



5

The domain of the function $f(x) = \log_{\left[x+\frac{1}{2}\right]} |x^2 - 5x + 6|$

A. $\left[\frac{3}{2}, 2\right) \cup (2, 3) \cup (3, \infty)$

B. $\left[\frac{3}{2}, \infty\right) \times$

C. $\left[\frac{1}{2}, \infty\right) \times$

D. None of these

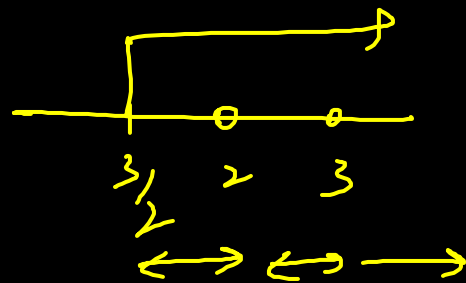
$[\cdot] \equiv \text{G.I.F.}$

$\log_{\text{a}}^{\text{N}} \rightarrow \begin{cases} \text{N} > 0 \\ \text{a} > 0 ; \text{a} \neq 1 \end{cases}$

$\left\{ \begin{aligned} |x^2 - 5x + 6| &> 0 \\ x^2 - 5x + 6 &\neq 0 \end{aligned} \right.$

$x^2 - 5x + 6 \neq 0$

$\boxed{x \neq 2, 3} \checkmark$



$$\textcircled{7} \quad \left\lceil x + \frac{1}{2} \right\rceil > 0$$

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

$$\boxed{x \geq \frac{1}{2}}$$

$$\left\{ x + \frac{1}{2} \right\} \neq 1$$

$$\left\lceil x + \frac{1}{2} \right\rceil = 1$$

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

$$\boxed{\frac{1}{2} \leq x < \frac{3}{2}}$$

Not allowed



If the domain of the given function is (a, b) then find $a+b$.

$$f(x) = \log_3 [-(\log_3 x)^2 + 5 \log_3 x - 6]$$

5

A. 9

B. 18

C. 27

D. 36

$$-(\log_3 x)^2 + 5(\log_3 x) - 6 > 0$$

let: $\boxed{\log_3 x = t}$

$$-t^2 + 5t - 6 > 0$$

$$\left. \begin{aligned} t^2 - 5t + 6 &< 0 \\ (t-2)(t-3) &< 0 \end{aligned} \right\}$$



$$\boxed{2 < t < 3}$$

$$2 < \log x < 3$$

Diagram showing the inequality $2 < \log x < 3$ with a bracket indicating the solution set $9 < x < 27$.

$$\boxed{9 < x < 27}$$

Domain: $(9, 27)$



Range of $f(x) = \ln(3x^2 - 4x + 5)$ is

input

A. $\left[\ln \frac{11}{3}, \infty\right)$

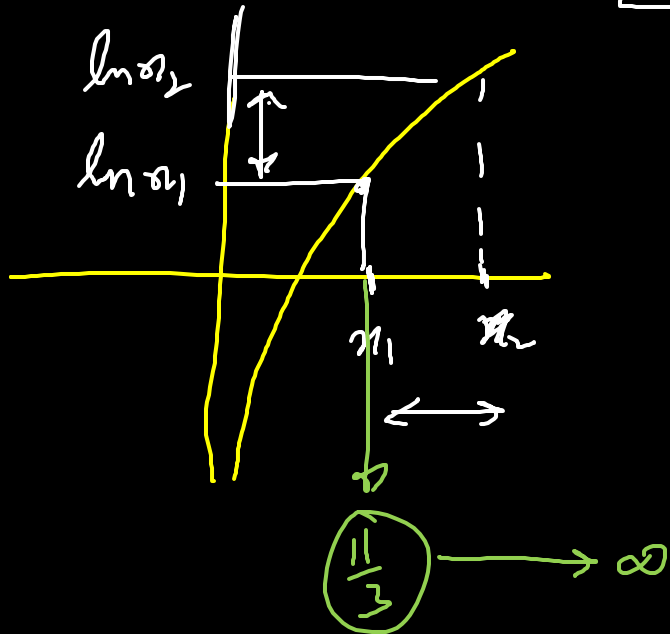
B. $[\ln 10, \infty)$

C. $\left[\ln \frac{11}{6}, \infty\right)$

D. $\left[\ln \frac{11}{12}, \infty\right)$

5

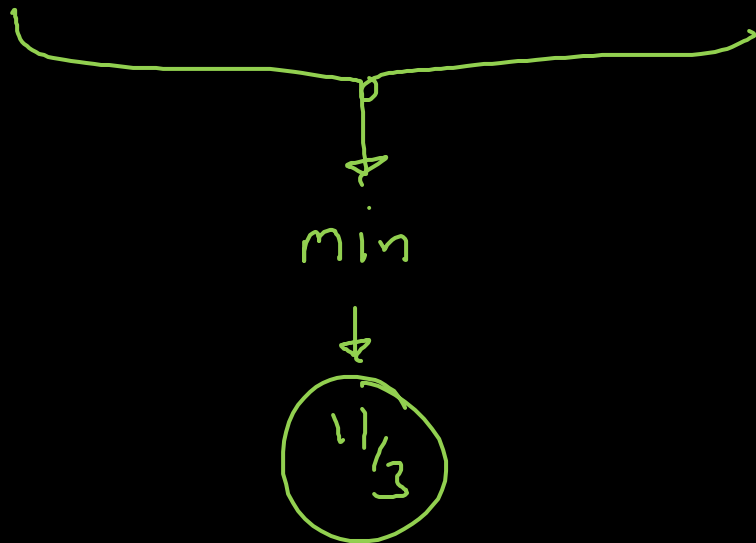
\log_e



$$\begin{aligned} & 3x^2 - 4x + 5 \\ & 3\left(x^2 - \frac{4}{3}x\right) + 5 \\ & 3\left[\left(x - \frac{2}{3}\right)^2 - \frac{4}{9}\right] + 5 \\ & 3\left(x - \frac{2}{3}\right)^2 - \frac{4}{3} + 5 \end{aligned}$$


$$3 \left(x - \frac{2}{3} \right)^2 + \left(\frac{11}{3} \right) \quad \left\{ \rightarrow \left[-\frac{D}{4a}, \infty \right) \right.$$

$$\geq 0$$





5

Domain of $f(x) = \sqrt{2\{x\}^2 - 3\{x\} + 1}$ where $\{.\}$ denotes the fractional part, in $[-1, 1]$ is  jee

A. $[-1, 1] \sim \left(\frac{1}{2}, 1\right)$

B. $\left[-1, -\frac{1}{2}\right] \cup \left[0, \frac{1}{2}\right] \cup \{1\}$

C. $\left[-1, \frac{1}{2}\right]$

D. $\left[-\frac{1}{2}, 1\right]$

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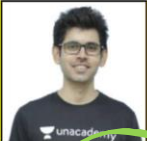
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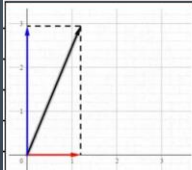
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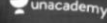


The screenshot shows a live class interface on the Unacademy platform. At the top, the Unacademy logo is visible. Below it, a question is displayed: "ROHIT SACHAN: Sir please solve the one more doubt...". The question text is partially obscured by a chemical reaction diagram. The diagram shows the reaction of aniline with $\text{HNO}_3/\text{H}_2\text{SO}_4$. Handwritten notes in red ink explain the mechanism: "e⁻ deficient" points to the nitronium ion (NO_2^+), and "e⁻ rich system" points to the benzene ring of aniline. A handwritten note also says "attacks on e⁻ rich system". On the right side, there is a video feed of the educator, Rohit Sachan, and a list of participants: Chaudhuri nitrATion, Rohit Sachan Sir B aa rha mera, Sinchan Dutta Chaudhuri right, Shooib Alam Left, Vsvsgs Right, Prashant Singh joined, and Rohit Sachan Left.

The screenshot shows a test series analysis page on the Unacademy platform. At the top, there are buttons for "View solutions" and "Share your results". Below these, a progress bar indicates "68 correct" and "2 incorrect" answers. The page is divided into sections for "Physics", "Chemistry", and "Mathematics". The "Physics" section is currently selected, showing a score of 88/120 and an accuracy of 73%. At the bottom, there is a section for "NEGATIVE MARKING" and a note that says "YOU MISSED OUT".



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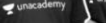




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







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






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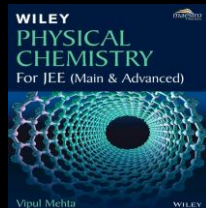
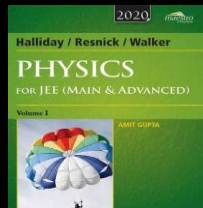
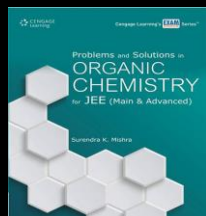
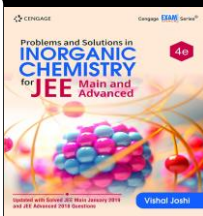
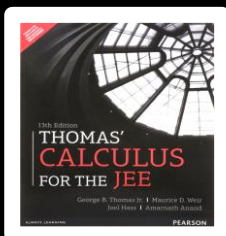


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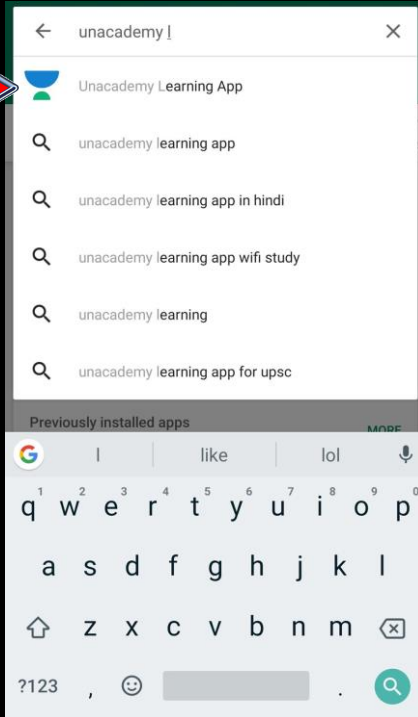
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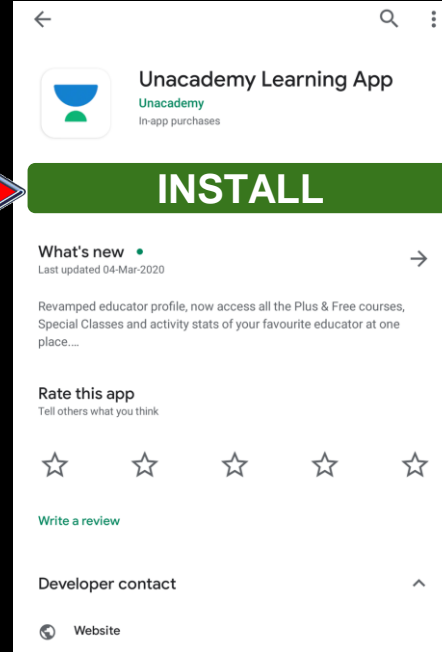
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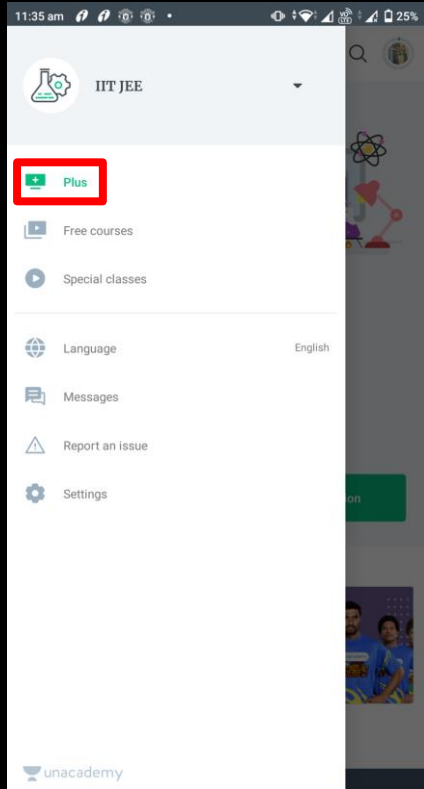
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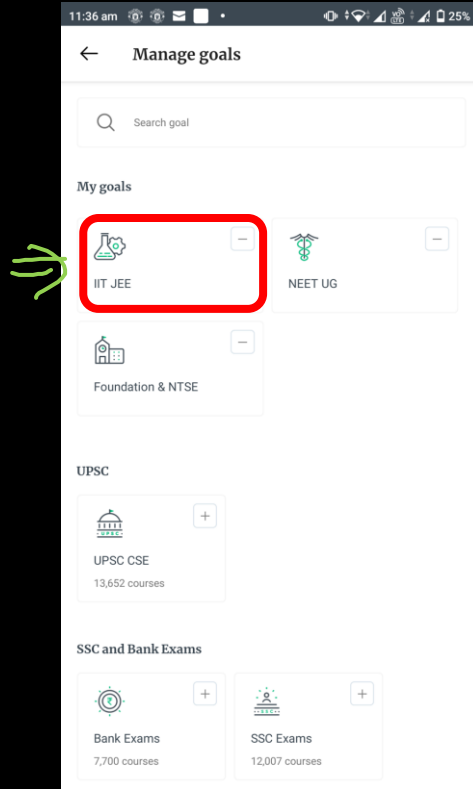
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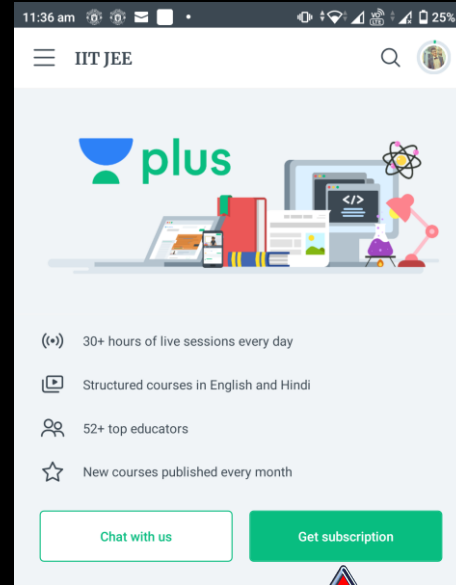
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