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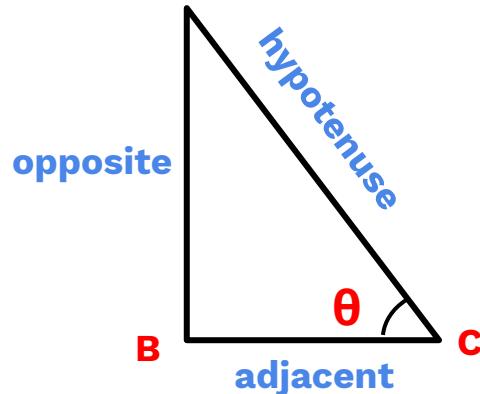


3.0

# Trigonometry

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Sameer Chincholikar



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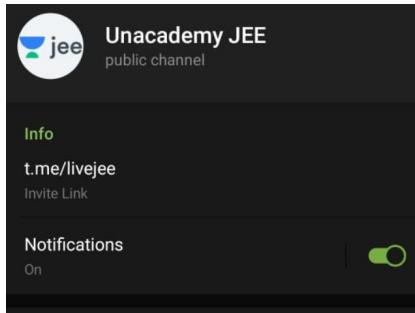
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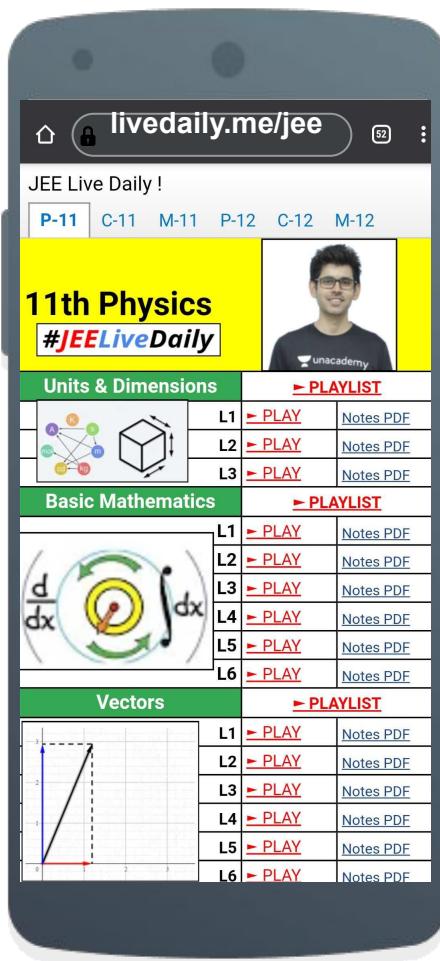
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Question

A shell is fired from a point O at an angle of 60 degrees with a speed of  $40 \text{ m/s}$  & it strikes a horizontal plane through O at a point A. The gun is fired a second time with the same angle of elevation but a different speed  $v$ . If it strikes the same point A, then the speed  $v$  has to be  $9\sqrt{3} \text{ m/s}$ , at the same instant, as the shell is fired. (Take  $g = 10 \text{ m/s}^2$ )

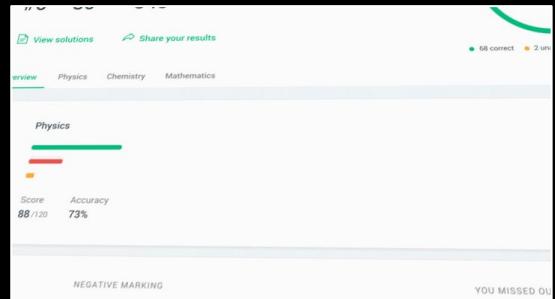
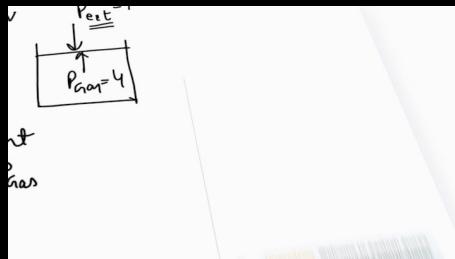
Self Inductance

As 'I' changes, 'Φ' changes and emf is induced  
this emf is called **'Self-induced emf'**  
as emf is induced because of ' $\Phi$  of loop itself.'

Corresponding induced emf

$$\epsilon = -L \frac{di}{dt}$$

L units : Volt-sec/Ampere  
use code JAYANT to enroll for Plus!



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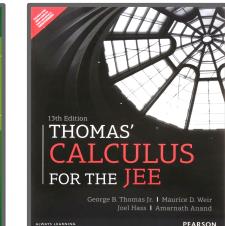
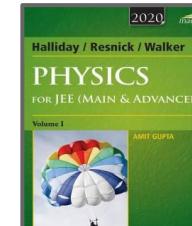
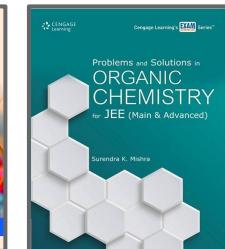
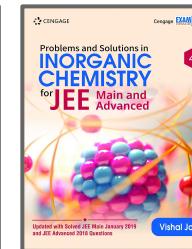
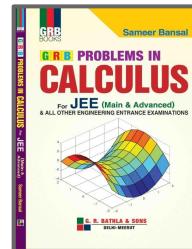
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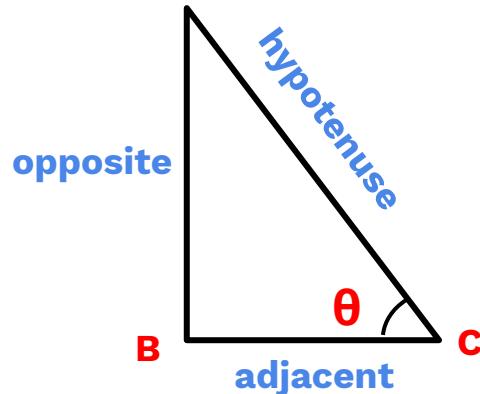
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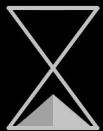
# Trigonometry

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The value of  $\cos \frac{\pi}{19} + \cos \frac{3\pi}{19} + \cos \frac{5\pi}{19} + \dots + \cos \frac{17\pi}{19}$  is equal to:

A.  $1/2$

B.  $0$

C.  $1$

D.  $2$



The value of  $\cos 0 + \cos \frac{\pi}{7} + \cos \frac{2\pi}{7} + \cos \frac{3\pi}{7} + \cos \frac{4\pi}{7} + \cos \frac{5\pi}{7} + \cos \frac{6\pi}{7}$  is

- A. 1/2
- B. -1/2
- C. 0
- D. 1



Find the value of :  $\sin^2 \frac{\pi}{18} + \sin^2 \frac{\pi}{9} + \sin^2 \frac{7\pi}{18} + \sin^2 \frac{4\pi}{9}$



Find the value of:  $\cos \frac{\pi}{11} \cos \frac{2\pi}{11} \cos \frac{3\pi}{11} \cos \frac{4\pi}{11} \cos \frac{5\pi}{11}$



Find the **sum of the following series:**

$$\frac{1}{\sin 45^\circ \sin 46^\circ} + \frac{1}{\sin 47^\circ \sin 48^\circ} + \frac{1}{\sin 49^\circ \sin 50^\circ} + \dots + \frac{1}{\sin 133^\circ \sin 134^\circ}$$

- A.  $\sec (1)^\circ$       B.  $\cosec (1)^\circ$       C.  $\cot (1)^\circ$       D.  $\tan (1)^\circ$



If  $x_1, x_2, x_3, \dots, x_n$  are in A.P. whose common difference is  $\alpha$ , then the value of  $\sin \alpha [\sec x_1 \sec x_2 + \sec x_2 \sec x_3 + \dots + \sec x_{n-1} \sec x_n]$  is equal to

A. 
$$\frac{\sin n\alpha}{\cos x_1 \cos x_n}$$

B. 
$$\frac{\sin (n-1)\alpha}{\cos x_1 \cos x_n}$$

C. 
$$\frac{\sin (n+1)\alpha}{\cos x_1 \cos x_n}$$

D. None of these



The value of  $\cos \frac{\pi}{10} \cos \frac{2\pi}{10} \cos \frac{4\pi}{10} \cos \frac{8\pi}{10} \cos \frac{16\pi}{10}$  is

A.  $\frac{\sqrt{10 + 2\sqrt{5}}}{64}$

B.  $-\frac{\cos(\frac{\pi}{10})}{16}$

C.  $\frac{\cos(\frac{\pi}{10})}{16}$

D.  $-\frac{\sqrt{10 + 2\sqrt{5}}}{16}$



**Find the number of solutions of the equation**

**$\sin x + |\cos x| = 0$  ; in the interval  $[0, 4\pi]$ .**



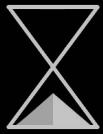
If the equation  $|\tan x| = \cos|x|$  has exactly three solutions in  $[0, n\pi/2]$ .

Then find the maximum integral value of n.



**Find the number of solutions of the equation**

$$|x+3| + |x-2| + 3\sin x - 3 = 0$$



**Find the number of solutions of  $\{x\} - \{-x\} = 0$  in the interval  $(0, 4)$ .  
(where  $\{.\}$  is fractional part function.)**



# #JEELiveDaily Schedule



11<sup>th</sup>



Namo Sir | Physics

6:00 - 7:30 PM



Ashwani Sir | Chemistry

7:30 - 9:00 PM



Sameer Sir | Maths

9:00 - 10:30 PM

12<sup>th</sup>



Jayant Sir | Physics

1:30 - 3:00 PM



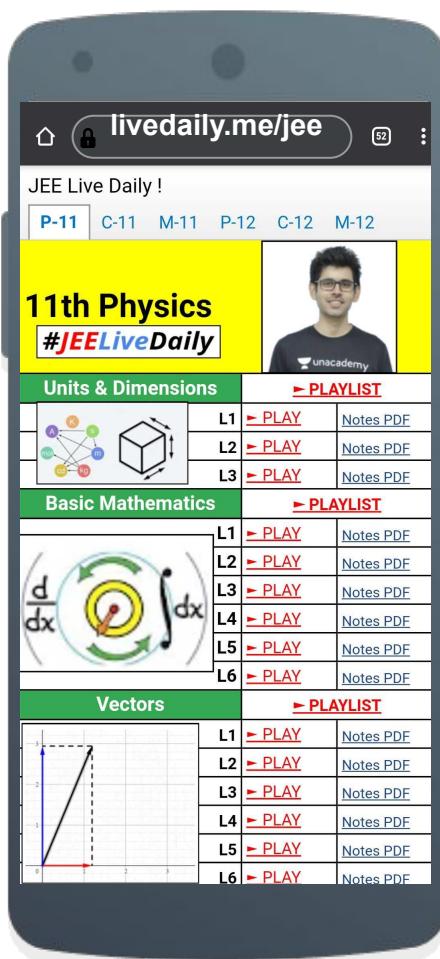
Anupam Sir | Chemistry

3:00 - 4:30 PM



Nishant Sir | Maths

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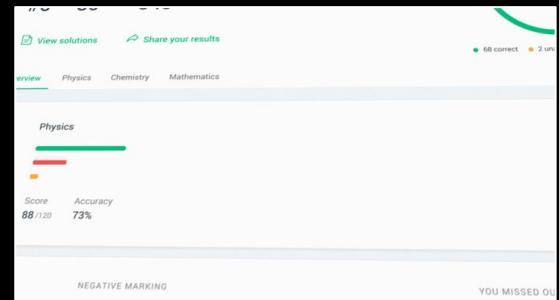
The first screenshot shows a live class interface with a teacher video feed, student names (Brijesh, Sagar, Sonwab), and a question about projectile motion.

The second screenshot shows a physics exercise titled "Self Inductance". It includes a diagram of a circular loop with current  $I$ , text explaining self-induced emf, and the formula  $e = -L \frac{di}{dt}$ .

The third screenshot shows a handwritten note with a diagram of a rectangle and the text  $P_{\text{ext}} = 4$ .

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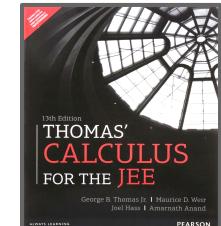
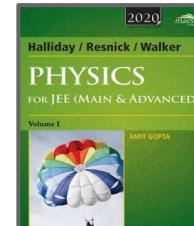
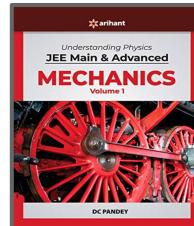
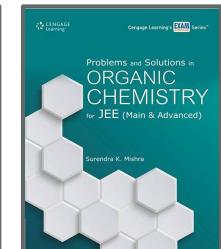
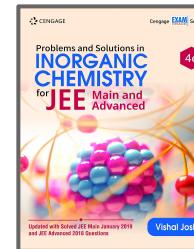
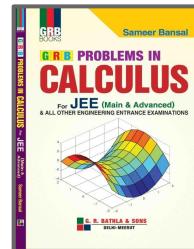
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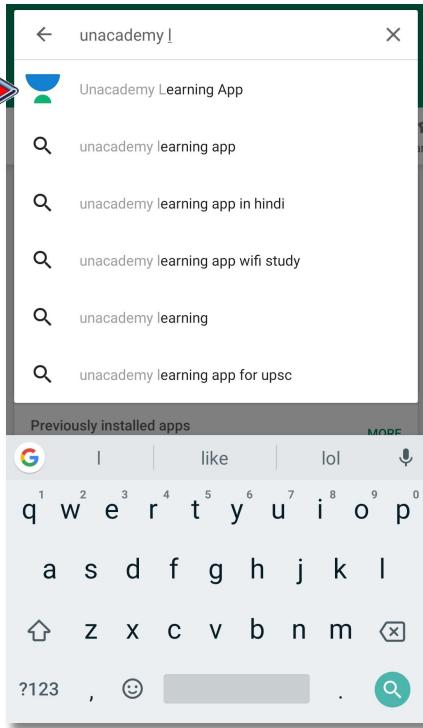


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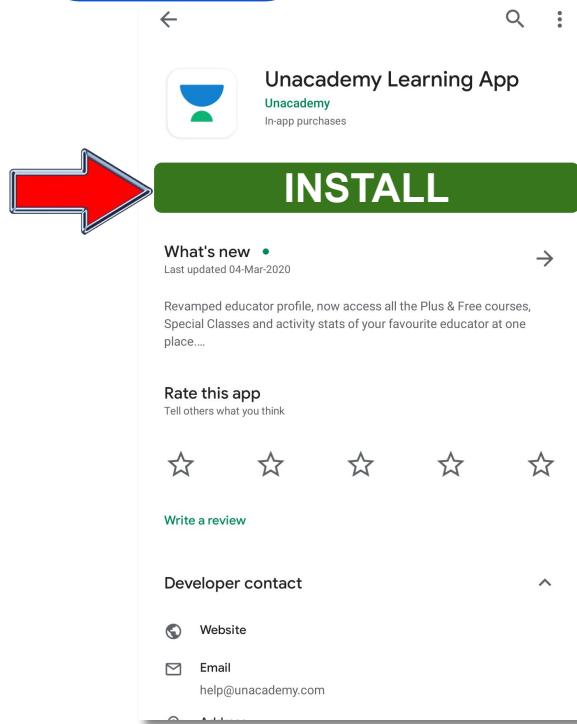


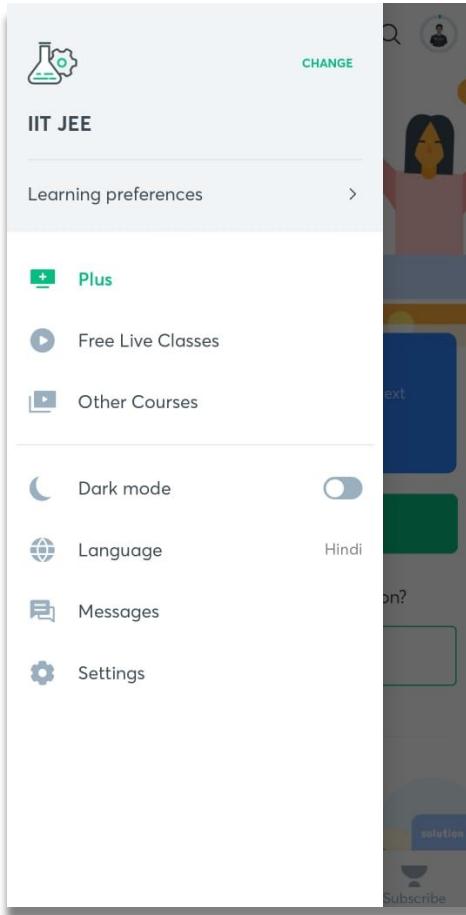
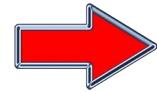
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## Step 2





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**Legend 3.0 Batch : JEE Main & Advanced 2022**

Starts on **19th May 2021**

**Emerge Batch (Class 11th) : JEE Main & Advanced 2023**

Starts on **20th May 2021**

**Spark 3.0 Batch : JEE Main & Advanced 2023**

Started on **26th May 2021**



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**T 20 Test Series - Target JEE 2022 - 18, 19, 20, 21, 22nd May**



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