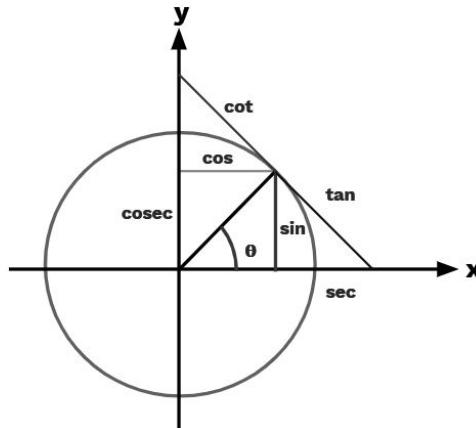


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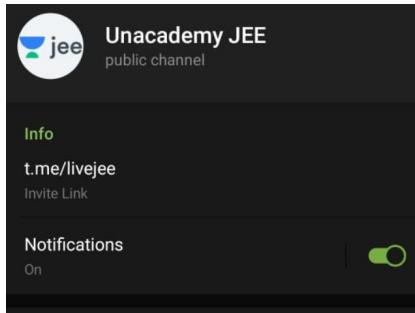
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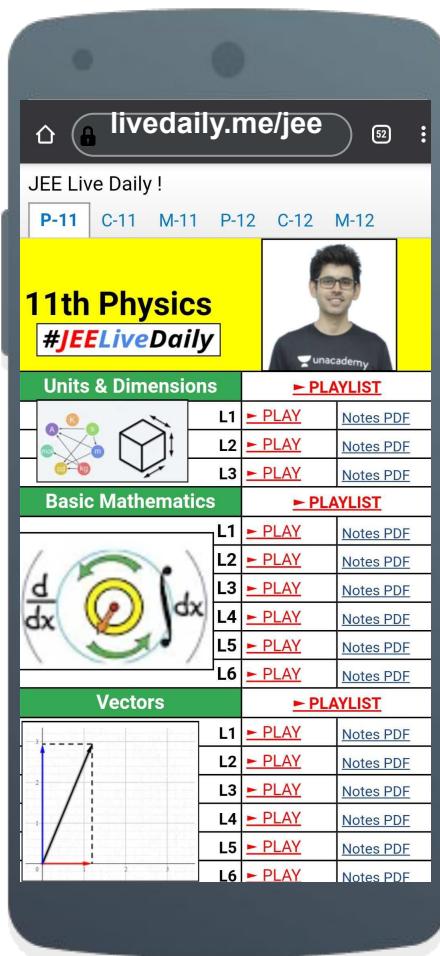
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A shell is fired from a point O at an angle of 60 degrees with a speed of 40 m/s & it strikes a horizontal plane through O at a point A. The gun is fired a second time with the same angle of elevation but a different speed v . If it strikes the same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

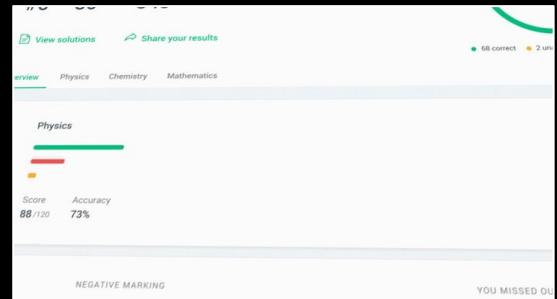
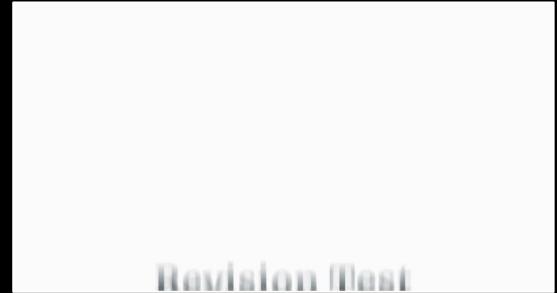
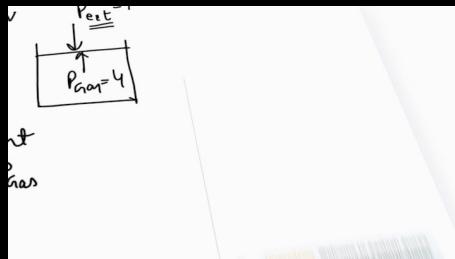
Self Inductance

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

Corresponding induced emf

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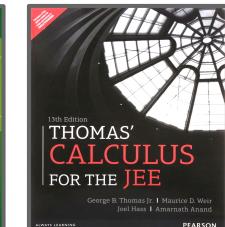
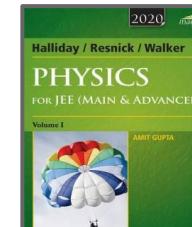
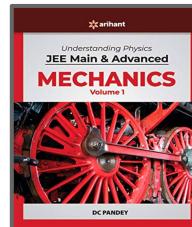
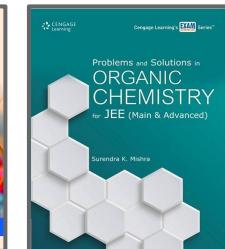
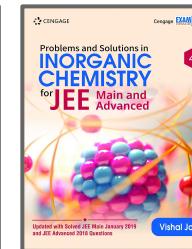
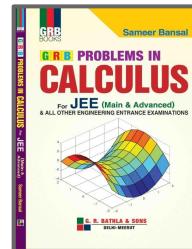
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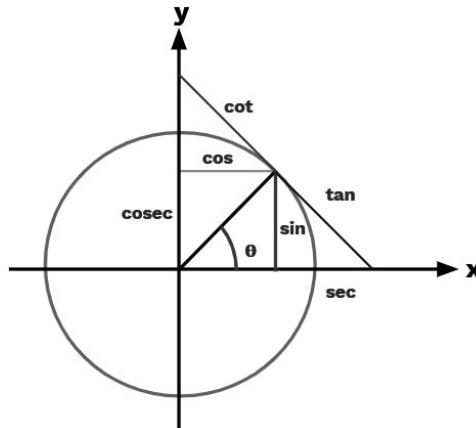
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Trigonometric Equations

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 If $\frac{\sin^4 x}{2} + \frac{\cos^4 x}{3} = \frac{1}{5}$, then

A. $\tan^2 x = \frac{2}{3}$

B. $\frac{\sin^8 x}{8} + \frac{\cos^8 x}{27} = \frac{1}{125}$

C. $\tan^2 x = \frac{1}{3}$

D. $\frac{\sin^8 x}{8} + \frac{\cos^8 x}{27} = \frac{2}{125}$

IIT-JEE 2009



Let n be a positive integer such that

$$\sin \frac{\pi}{2n} + \cos \frac{\pi}{2n} = \frac{\sqrt{n}}{2}. \text{ Then}$$

- A. $6 \leq n \leq 8$
- B. $4 < n \leq 8$
- C. $4 \leq n \leq 8$
- D. $4 < n < 8$

IIT-JEE 1994



The positive integer value of $n > 3$ satisfying the equation

$$\frac{1}{\sin\left(\frac{\pi}{n}\right)} = \frac{1}{\sin\left(\frac{2\pi}{n}\right)} + \frac{1}{\sin\left(\frac{3\pi}{n}\right)}$$
 is

IIT-JEE 2011



The number of solutions of the pair of equations $2 \sin^2 \theta - \cos 2\theta = 0$,
 $2 \cos^2 \theta - 3 \sin \theta = 0$ in the interval $[0, 2\pi]$ is

- A. zero
- B. one
- C. two
- D. four

IIT-JEE 2007



The number of all possible values of θ where $0 < \theta < \pi$, for which the system of equations

$$(y+z) \cos 3\theta = (xyz) \sin 3\theta$$

$$x \sin 3\theta = \frac{2 \cos 3\theta}{y} + \frac{2 \sin 3\theta}{z}$$

$$(xyz) \sin 3\theta = (y+2z) \cos 3\theta + y \sin 3\theta$$

have a solution (x_0, y_0, z_0) with $y_0, z_0 \neq 0$, is

IIT-JEE 2010



For $x \in (0, \pi)$, the equation $\sin x + 2\sin 2x - \sin 3x = 3$ has

- A. Infinitely many solutions
- B. Three solutions
- C. One solution
- D. No solution

JEE Adv. 2014



The equation $(\cos p - 1)x^2 + (\cos p)x + \sin p = 0$. In the variable x , has real roots. Then p can take any value in the interval.

- A. $(0, 2\pi)$
- B. $(-\pi, 0)$
- C. $(-\pi/2, \pi/2)$
- D. $(0, \pi)$

IIT-JEE 1990



Let $\theta, \varphi \in [0, 2\pi]$ be such that

$$2 \cos \theta (1 - \sin \varphi) = \sin^2 \theta \left(\tan \frac{\theta}{2} + \cot \frac{\theta}{2} \right) \cos \varphi - 1,$$

$\tan(2\pi - \theta) > 0$ and $-1 < \sin \theta < -\frac{\sqrt{3}}{2}$, then φ cannot satisfy

JEE Adv. 2012

A. $0 < \varphi < \frac{\pi}{2}$

B. $\frac{\pi}{2} < \varphi < \frac{4\pi}{3}$

C. $\frac{4\pi}{3} < \varphi < \frac{3\pi}{2}$

D. $\frac{3\pi}{2} < \varphi < 2\pi$



The equation $2\cos^2 \frac{x}{2} \sin^2 x = x^2 + x^{-2}$; $0 < x \leq \frac{\pi}{2}$ has

- A. No real solution
- B. One real solution
- C. More than one solution
- D. None of these

IIT-JEE 1980



#JEELiveDaily Schedule



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



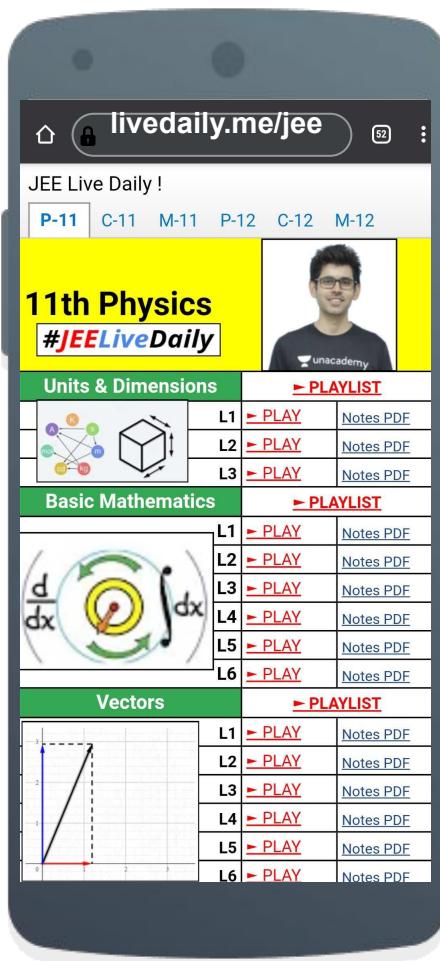
Anupam Sir | Chemistry

3:00 - 4:30 PM



Nishant Sir | Maths

4:30 - 6:00 PM

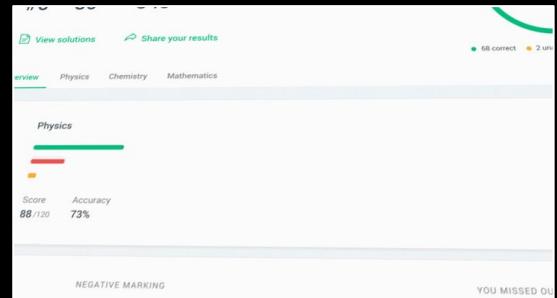


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(Take $g = 10 \text{ m/s}^2$)

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

Corresponding induced emf

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


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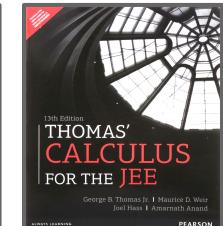
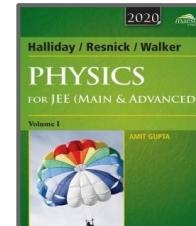
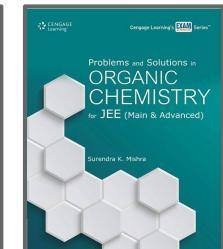
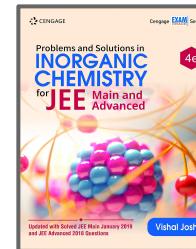
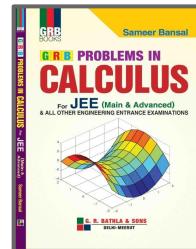
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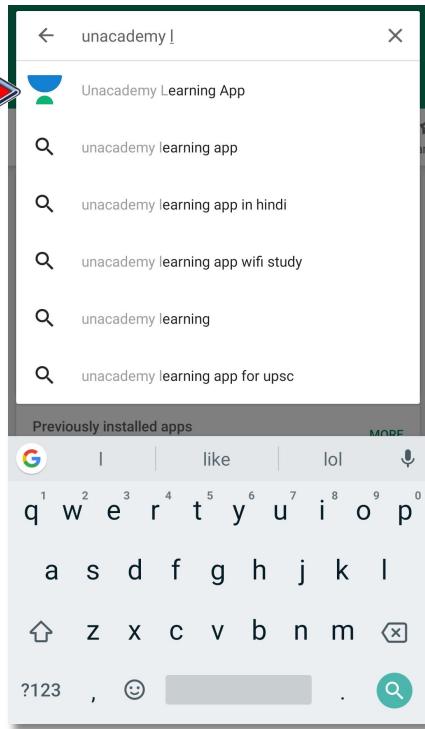


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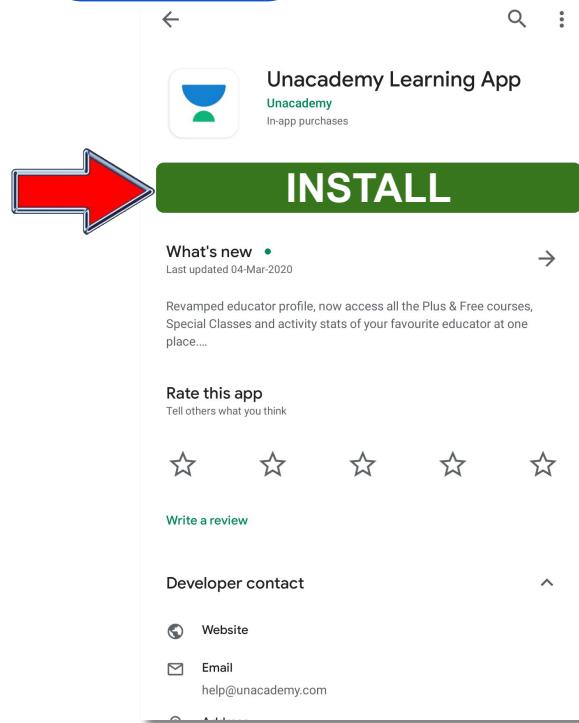


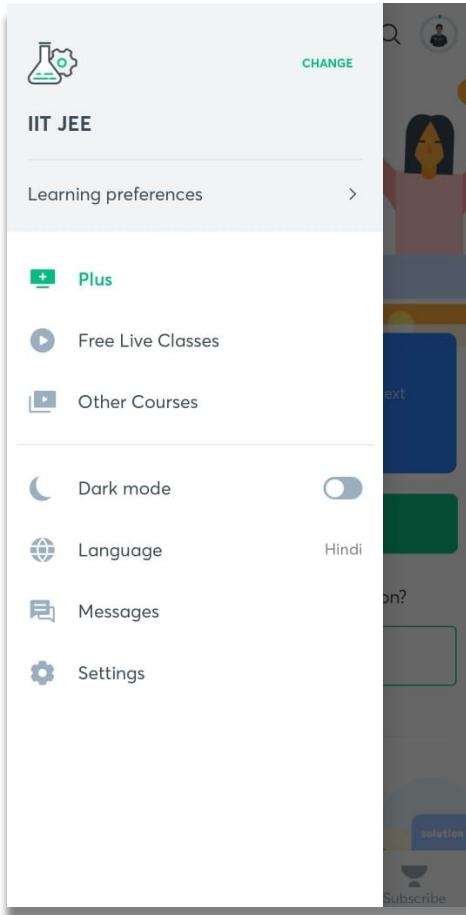
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