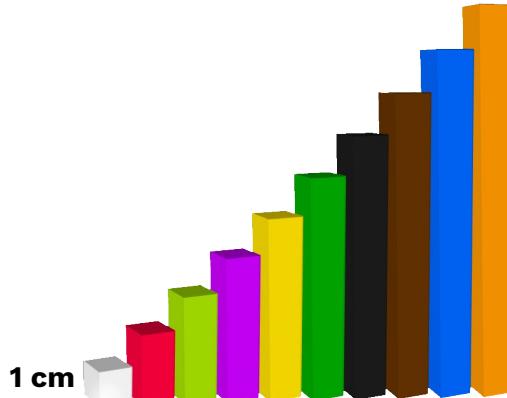


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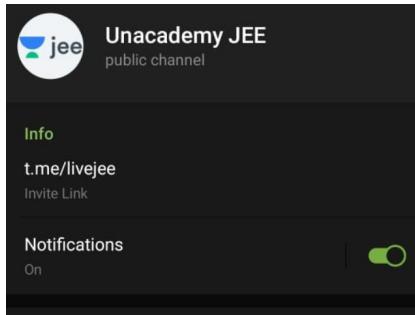
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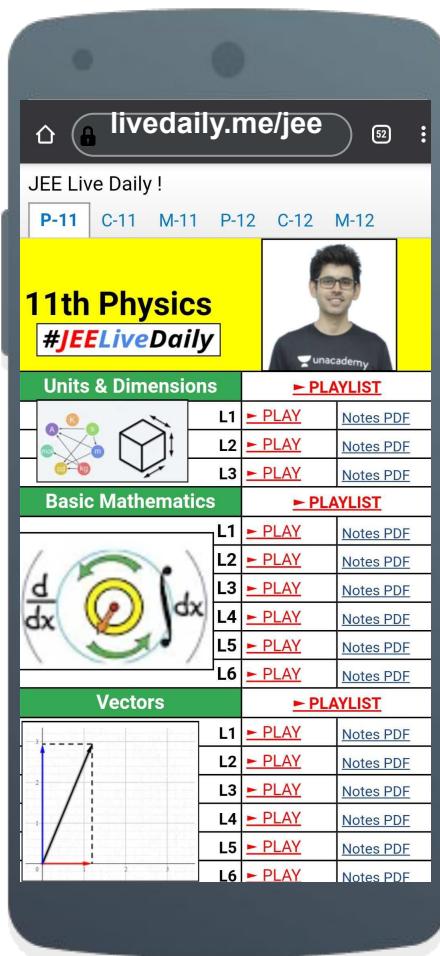
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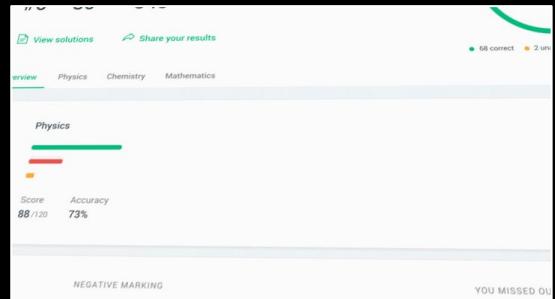
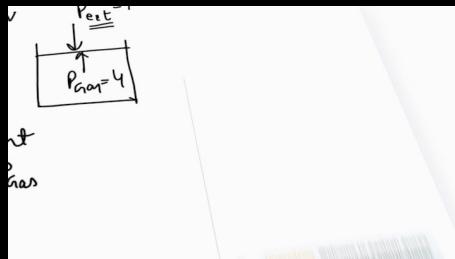
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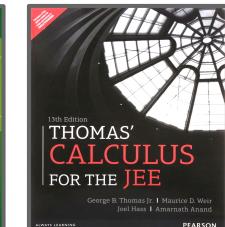
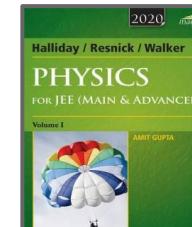
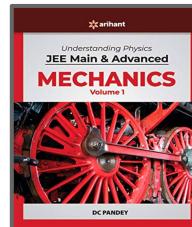
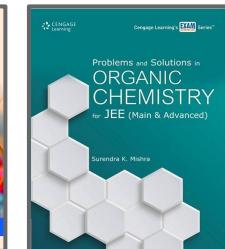
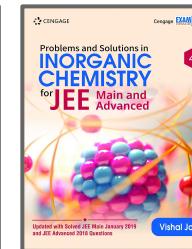
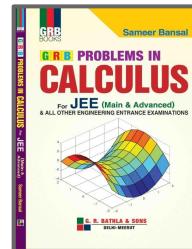
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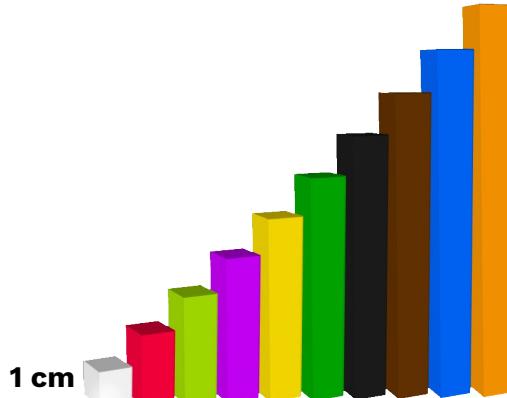
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# Sequences & Series

JPP

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Let  $ABCD$  is a unit square and  $0 < \alpha < 1$ . Each side of the square is divided in the ratio  $\alpha : (1 - \alpha)$ , as shown in figure. These points are connected to obtain another square. The sides of new square are divided in the ratio  $\alpha : (1 - \alpha)$  and points are joined to obtain another square. The process is continued indefinitely. Let  $a_n$  denote the length of  $n^{\text{th}}$  side and  $A_n$  the area of the  $n^{\text{th}}$  square.

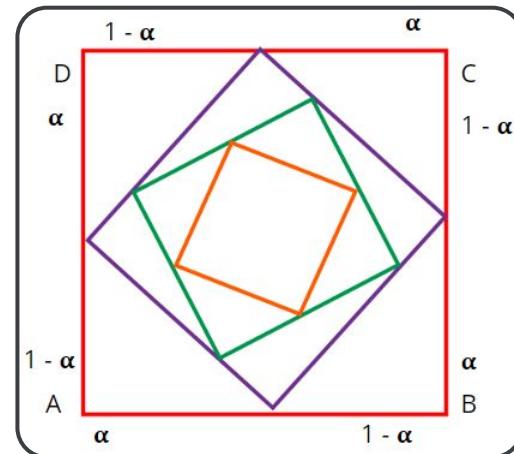
The value of  $\alpha$  for which  $\sum_{n=1}^{\infty} A_n = \frac{8}{3}$

A.  $\frac{1}{3}, \frac{2}{3}$

B.  $\frac{1}{4}, \frac{3}{4}$

C.  $\frac{1}{5}, \frac{4}{5}$

D.  $\frac{1}{2}$





If positive numbers  $a, b, c$  are in H.P., then equation  
 $x^2 - kx + 2b^{101} - a^{101} - c^{101} = 0$  ( $k \in \mathbb{R}$ ) has

- A. Both roots positive
- B. Both roots negative
- C. One positive and one negative root
- D. Both roots imaginary



If  $a, b, c \in \mathbb{R}^+$ , then  $\frac{bc}{b+c} + \frac{ac}{a+c} + \frac{ab}{a+b}$  is always

- A.  $\leq \frac{1}{2}(a+b+c)$
- B.  $\geq \frac{1}{3}\sqrt{abc}$
- C.  $\leq \frac{1}{3}(a+b+c)$
- D.  $\geq \frac{1}{2}\sqrt{abc}$



The minimum value of the sum of real numbers

$a^{-5}$ ,  $a^{-4}$ ,  $3a^{-3}$ , 1,  $a^8$  and  $a^{10}$  where  $a > 0$  is

IIT-JEE 2011



If  $a, b, c$  are positive real numbers. Then prove that

$$(a + 1)^7 (b + 1)^7 (c + 1)^7 > 7^7 a^4 b^4 c^4$$

IIT-JEE 2004



If the sum of first  $n$  terms of an A.P. is  $cn^2$ , then the sum of squares of these  $n$  terms is

- A.  $\frac{n(4n^2 - 1)c^2}{6}$     B.  $\frac{n(4n^2 + 1)c^2}{3}$     C.  $\frac{n(4n^2 - 1)c^2}{3}$     D.  $\frac{n(4n^2 + 1)c^2}{6}$

IIT-JEE 2009



Let  $a_1, a_2, a_3, \dots, a_{100}$  be an arithmetic progression with  $a_1 = 3$  and

$$S_p = \sum_{i=1}^p a_i, 1 \leq p \leq 100$$

For any integer  $n$  with  $1 \leq n \leq 20$ , let  $m = 5n$ . If  $\frac{S_m}{S_n}$

does not depend on  $n$ , then  $a_2$  is

IIT-JEE 2011



Let  $a_1, a_2, \dots, a_{10}$  be in harmonic progression with  $a_1 = 5$  and  $a_{20} = 25$ .

The least positive integer n for which  $a_n < 0$  is

A. 22

B. 23

C. 24

D. 25

IIT-JEE 2012



If the sum of the first ten terms of the series

$$\left(1\frac{3}{5}\right)^2 + \left(2\frac{2}{5}\right)^2 + \left(3\frac{1}{5}\right)^2 + 4^2 + \left(4\frac{4}{5}\right)^2 + \dots \text{, is } \frac{16}{5} \text{ m,}$$

then m is equal to:

A. 100

B. 101

C. 99

D. 102

JEE M 2016



✓ Passage:

Let  $A_1, G_1, H_1$ , denote the arithmetic, geometric and harmonic means, respectively, of two distinct positive numbers. For  $n \geq 2$ , Let  $A_{n-1}$  and  $H_{n-1}$  have arithmetic, geometric and harmonic means as  $A_n, G_n, H_n$ , respectively. Which one of the following statements is correct?

IIT-JEE 2007

- A.  $G_1 > G_2 > G_3 \dots\dots\dots$
- B.  $G_1 < G_2 < G_3 \dots\dots\dots$
- C.  $G_1 = G_2 = G_3 \dots\dots\dots$
- D.  $G_1 < G_3 < G_5 \dots\dots \text{ and } G_2 > G_4 > G_6 \dots\dots$



 Passage:

Let  $A_1, G_1, H_1$ , denote the arithmetic, geometric and harmonic means, respectively, of two distinct positive numbers. For  $n \geq 2$ , Let  $A_{n-1}$  and  $H_{n-1}$  have arithmetic, geometric and harmonic means as  $A_n, G_n, H_n$ , respectively.

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IIT-JEE 2007

- A.  $A_1 > A_2 > A_3 > \dots$
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- C.  $A_1 > A_3 > A_5 > \dots$  and  $A_2 < A_4 < A_6 < \dots$
- D.  $A_1 < A_3 < A_5 < \dots$  and  $A_2 > A_4 > A_6 > \dots$



Passage:

Let  $A_1, G_1, H_1$ , denote the arithmetic, geometric and harmonic means, respectively, of two distinct positive numbers. For  $n \geq 2$ , Let  $A_{n-1}$  and  $H_{n-1}$  have arithmetic, geometric and harmonic means as  $A_n, G_n, H_n$ , respectively.

Which one of the following statements is correct?

IIT-JEE 2007

- A.  $H_1 > H_2 > H_3 > \dots$
- B.  $H_1 < H_2 < H_3 < \dots$
- C.  $H_1 > H_3 > H_5 > \dots$  and  $H_2 < H_4 < H_6 < \dots$
- D.  $H_1 < H_3 < H_6 < \dots$  and  $H_2 > H_4 > H_6 > \dots$



# #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



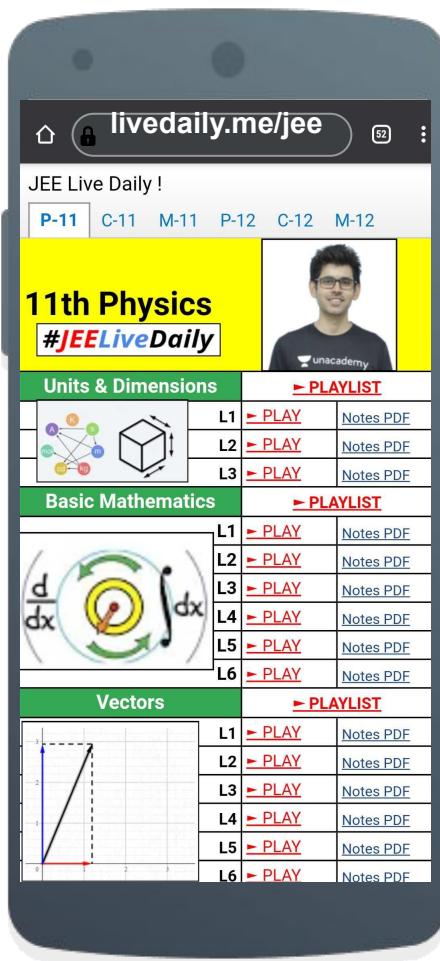
Anupam Sir | Chemistry

3:00 - 4:30 PM



Nishant Sir | Maths

4:30 - 6:00 PM

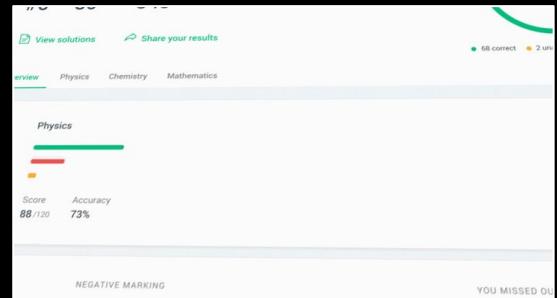
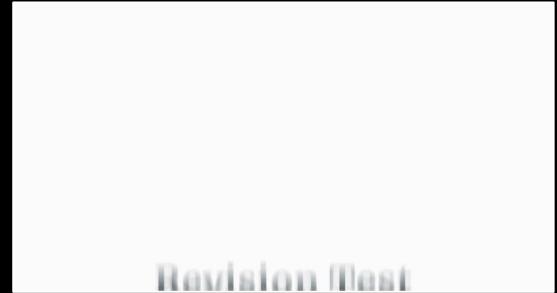


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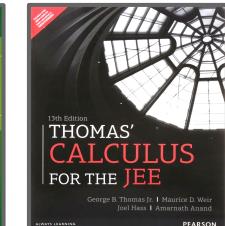
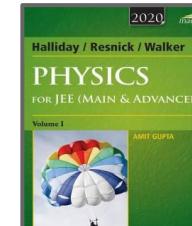
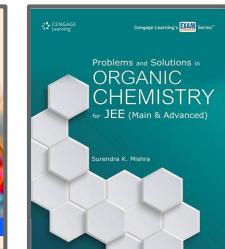
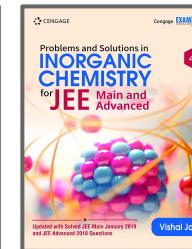
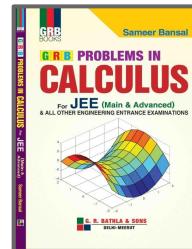
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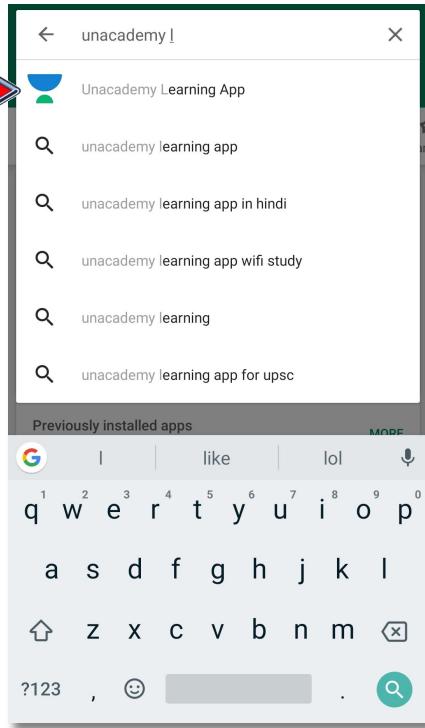


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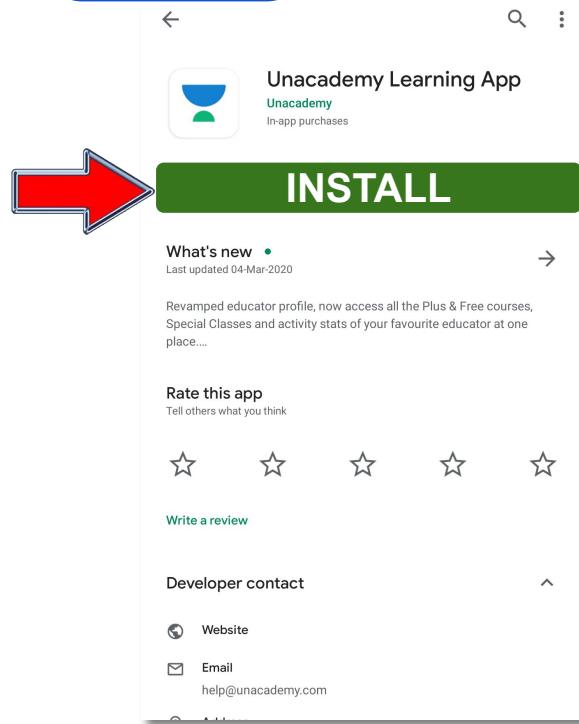


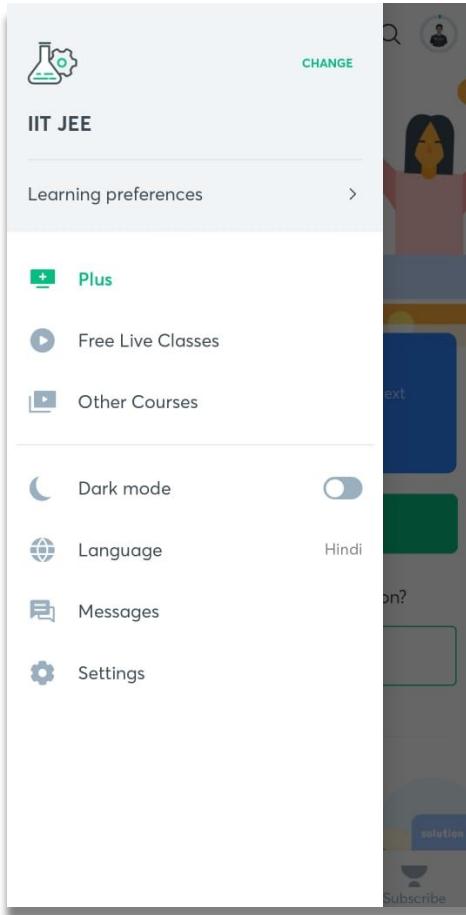
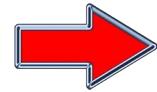
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