Let
$$\mathrm{S} = \sum_{i=1}^n f(x_i), \mathrm{A} = \sum_{i=1}^a f(x_i)$$
 and $\mathrm{B} = \sum_{i=a}^n f(x_i)$ then

Which of the following is/are ALWAYS true?

(Consider f as some arbitary function)

$$A.S = A + B$$

B.
$$\mathrm{S} = \sum_{i=1}^{a-1} f(x_i) + f(x_a) + \mathrm{B}$$

$$\mathsf{C.\,S} = \sum_{i=1}^{a-1} f(x_i) + \mathsf{B}$$

$$\mathsf{D.\,S} = \mathsf{A} + \mathsf{B} - f(x_a)$$

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Answer

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Answer: Options C and D are Correct

Given:





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$$B=\sum_{i=a}^{n} f(x_i)$$

Option A) It says S = A + B, which means $\sum_{i=1}^{a} f(x_i) + \sum_{i=a}^{n} f(x_i)$, when summation will be done then the term $f(x_a)$ had been added two times. The first time in A and the second time in B. So Instead of S = A+B, it must be $S=A+B-f(x_a)$

Option B)
$$S = \sum_{i=1}^{a-1} f(x_i) + f(x_a).+B$$

As we know B = $\sum_{i=a}^{n} f(x_i)$, And in summation we are adding $f(x_a)$ so overcounting of $f(x_a)$ had been done in this case. So this option is Incorrect.

Option C)S =
$$\sum_{i=1}^{a-1} f(x_i)$$
 +B

In this option, $\sum_{i=1}^{a-1} f(x_i) + \sum_{i=a}^n f(x_i)$ had been done. So it can easily be observable that on the right-hand side of this option that each term is added once so we can write this as :

$$\sum_{i=1}^{a-1} f(x_i) + \sum_{i=a}^{n} f(x_i) = \sum_{i=1}^{n} f(x_i) = S$$

Actually here, The terms are broken down into two parts first from 1 to a-1 and second from a to n. So we are just adding both broken parts which give the result as from 1 to n.

Option c is correct.

Option D). S= A+B-
$$f(x_a)$$

Here while doing a summation of A and B the term $f(x_a)$ had been overcounted means counted two times but here, one time had been subtracted. So this option is also correct. As already explained in option A.

answered Mar 1, 2023 · selected Mar 6, 2024 by Deepak Poonia





GauravRajpurohit 🕜

Evaluate: $1+(1+b)r+(1+b+b^2)r^2+\ldots$ to infinite terms for |br|<1.

- A. $\frac{1}{(1-br)(1-r)}$
- B. $\frac{1}{(1-r)(1-b)}$
- C. $\frac{1}{(1-b)(b-r)}$
- D. None of these

Quantitative Aptitude

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Answer

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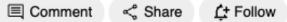
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Solution: Let
$$S = 1 + (1 + b)r + (1 + b + b^2) r^2 +$$
(i) $rS = r + (1 + b) r^2 +$ (ii) $(i) - (ii)$ $\Rightarrow (1 - r)S = 1 + br + b^2r^2 + b^3r^3 +$ $\Rightarrow S = \frac{1}{(1 - br)(1 - r)}$

answered May 1, 2022 · selected Mar 6, 2024 by Deepak Poonia



GO Classes OP 🗸

Evaluate $1+2x+3x^2+4x^3+\ldots$ upto infinity, where |x|<1.

- A. $\frac{1}{(1-x)^2}$ B. $\frac{x}{(1-x)^2}$ C. $\frac{x^2}{(1-x)^2}$ D. $1 \frac{1}{(1-x)^2}$



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#quantitative-aptitude

#infinite-geometric-progression

#one-mark

Answer

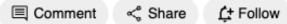
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Solution: Let
$$S = 1 + 2x + 3x^2 + 4x^3 +$$
(i) $xS = x + 2x^2 + 3x^3 +$ (ii) $(i) - (ii) \Rightarrow (1 - x) S = 1 + x + x^2 + x^3 +$ or $S = \frac{1}{(1 - x)^2}$

answered May 1, 2022





Find the sum of first 24 terms of the $A.P.\ a_1,\ a_2,\ a_3,\ \dots$ if it is known that

$$a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 225$$

Quantitative Aptitude

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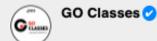
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Therefore, d=b-a

$$\Rightarrow a_1 + a_{24} = a_5 + a_{20} = a_{10} + a_{15}$$

It is given that

$$(a_1 + a_{24}) + (a_5 + a_{20}) + (a_{10} + a_{15}) = 225$$

$$\Rightarrow$$
 $(a_1 + a_2 4) + (a_1 + a_{24}) + (a + a_{24}) = 225$

$$\Rightarrow 3(a_1 + a_{24}) = 225$$

$$\Rightarrow a_1 + a_{24} = 75$$

We know that

$$\mathrm{S}_n=rac{n}{2}[a+l],$$

Where a is the first term, and l is the last term of an A.P.

$$\mathrm{S}_{24} = rac{24}{2}[a_1 + a_{24}] = 12 imes 75 = 900.$$

answered May 1, 2022 · edited May 1, 2022 by Lakshman Bhaiya







GO Classes OP 🗸

Let k be some integer and it is given that $a \equiv b \pmod{n}$ then which of the following(s) is/are ALWAYS true?

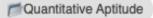
More than one option can be true.

$$A. a \equiv b - 3n \pmod{n}$$

$$B. a \equiv b + k \pmod{n}$$

$$C. a + k \equiv b + k \pmod{n}$$

$$D. a + 5n \equiv b - 3n \pmod{n}$$



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Given $a \equiv b \pmod{\mathrm{n}}$ i.e. (a-b)%n = 0

Option A: True

$$a \equiv b - 3n \pmod{\mathrm{n}} = (a - b + 3n)\%n = ((a - b)\%n + (3n)\%n)\%n = (0 + 0)\%n = 0$$

Option B: False

$$a \equiv b + k \pmod{n} = ((a - b)\%n - (k\%n))\%n = (-k)\%n$$

Now since k can be any integer, k might not be a multiple of n.

Option C: True

$$a+k\equiv b+k\ (\mathrm{mod}\ \mathrm{n})=(a+k-b-k)\%n=(a-b)\%n=0$$

Option D: True

$$a+5n \equiv b-3n \pmod{n} = (a+5n-b+3n)\%n = ((a-b)\%n+(8n)\%n)\%n = (0+0)$$

answered Mar 1, 2023





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Shoto 🕜

Which of the following(s) ALWAYS hold given that $a \equiv b \pmod{n}$ is true for some integers a, b and n.

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More than one option can be true.

A. $a \mod n = b \mod n$

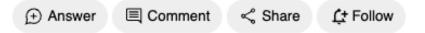
B. n | (a - b)

Quantitative Aptitude



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#modular-arithmetic #multiple-selects #two-marks





#quantitative-aptitude

Answer : A, B

 $Given: a \equiv b \pmod{n}$

ATE

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Now, let a mod $n = b \mod n = r$ which is the remainder when a or b is divided by n

So 'a' can be written as: $a = n * q_1 + r$ where $q_1 \rightarrow Quotient$ when a is divided by n and $r \rightarrow Remainder$

And 'b' can be written as: $b = n * q_2 + r$ where $q_2 \rightarrow Quotient$ when b is divided by n and $r \rightarrow Remainder$

Now, $a - b = (n * q_1 + r) - (n * q_2 + r)$

 $a - b = n(q_1 - q_2)$ which is clearly divisible by n

Hence, $n \mid (a - b)$ is True

Options C and D are asking us that if n always divides 'a' and 'b' given $a \equiv b \pmod{n}$

So one idea here could be to think of an counter example where this is not true

Lets Take $27 \equiv 47 \pmod{10}$, here $10 \mid 27$ is false as you can see and also $10 \mid 47$ is also false.

Hence, Options C and D are false

answered Mar 1, 2023 · edited Jul 6, 2024 by Harsh Saini_1





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Harsh Saini_1 🕜

Which of the following options is/are TRUE?

 $A. 43 \equiv -2 (\bmod 5)$

 $B. 5 \equiv -7 \pmod{3}$

 $C. -10 \equiv -25 \pmod{7}$

 $D. 8 \equiv -8 \pmod{5}$

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Answer

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"We can say that a is congruent to b modulo n, written $a = b \pmod{n}$ if $n \mid (a - b)$."

Now we apply this to the options...

A. $43 = -2 \pmod{5}$ so $5 \cdot (43+2) = (43+2) / 5 = 45/5 = 9$ so it is correct.

B. $5 = -7 \pmod{3}$ so $3 \cdot (5+7) = 12 / 3 = 4$ so it is correct.

C. $-10 = -25 \pmod{7}$ so $7 \cdot (-10+25) = 15 \cdot 7$. But 15 is not divisible by 7.

D. $8 = -8 \pmod{5}$ so $5 \cdot (8+8) = 16 / 5$. But 16 is not divisible by 5.

Hence, A and B are TRUE.

answered Mar 1, 2023



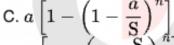




Akash 15 🕜

If S is the sum to infinity of a G.P. whose first term is a', then the sum of the first a terms is

A.
$$S\left(1-\frac{a}{S}\right)^n$$
B. $S\left[1-\left(1-\frac{a}{S}\right)^n\right]$



D. S
$$\left[1 - \left(1 - \frac{S}{a}\right)^n\right]$$



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Given that first term = a.

S= sum to infinity of a $G.P=\dfrac{a}{(1-r)}$

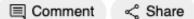
$$\Rightarrow r = 1 - rac{a}{\mathrm{S}}$$

$$\Rightarrow \mathrm{S}_n = \frac{a(1-r^n)}{(1-r)}$$

$$\Rightarrow \mathrm{S}_n = \mathrm{S}(1-r^n)$$

$$\Rightarrow \mathbf{S}_n = \mathbf{S} \left[1 - \left(1 - \frac{a}{\mathbf{S}} \right)^n \right]$$

answered May 1, 2022 · edited May 1, 2022 by Lakshman Bhaiya









If the sum of p terms of an A.P. is q and the sum of q terms is p, then the sum of p+q terms is A. 0 B. p-qC. p+qD. -(p+q)Quantitative Aptitude #goclasses2025_csda_wq1 # goclasses #quantitative-aptitude #arithmetic-series #two-marks Comment **≪** Share Answer ⊈ Follow GO Classes

Let a be the first term and d be the common difference the AP's. Then sum to their n terms is aiven by.



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$$S_p = q$$

$$\frac{p}{2}\{2a+(p-1)d\}=2ap+p(p-1)d=2q \longrightarrow (i)$$

Similarly,

$$egin{aligned} S_q &= p \ rac{q}{2}\{2a+(q-1)d\} &= p \ 2aq+q(q-1)d &= 2p &\longrightarrow (ii) \end{aligned}$$

Subtract equation (ii) from equation (i), we get

$$2a(p-q)+\{p(p-1)-q(q-1)\}d=2q-2p$$

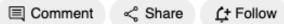
 $2a+(p+q-1)d=-2 \longrightarrow (iii)$

$$egin{aligned} S_{p+q} &= rac{p+q}{2}\{2a+(p+q-1)d\} \ S_{p+q} &= rac{p+q}{2}(-2) & ext{ [:: From equation (iii)]} \ \hline S_{p+q} &= -(p+q) \end{bmatrix} \end{aligned}$$

Reference:

 https://lh6.googleusercontent.com/Qerpe-hTn1BPh_0QyQfHDxcqXEotQFnMVKJ0I3_CtJ8PPK-WFc82FQfTIKDtJPFK2lcMxlLuyQC_NP4T8Quqg9CEDmwzfl6Ka_cMnlYDiDXhBQNoDnpOdAUzofioxN4GW5-U1b

answered May 1, 2022 · selected Oct 6, 2023 by Arjun



GO Classes OP (2)

f the sum of an infinitely decreasing GP is $3,$ and the sum of	the squares of its terms is $9/2$, the
sum of the cubes of the terms is	
A. $\frac{105}{13}$ B. $\frac{108}{13}$ C. $\frac{729}{8}$ D. None of these	
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#infinite-geometric-progression #two-marks	
⊕ Answer	GO Classes 🗸

Let the GP be a,ar,ar^2,\ldots , where 0< r<1. Then, $a+ar+ar^2+\ldots=3$ and $a^2+a^2r^2+a^2r^4+\ldots=9/2$.

$$\implies \frac{a}{1-r} = 3$$
 and $\frac{a^2}{1-r^2} = \frac{9}{2}$

$$\implies rac{9(1-r)^2}{1-r^2} = rac{9}{2} \implies rac{1-r}{1+r} = rac{1}{2} \implies r = rac{1}{3}.$$

Putting $r = \frac{1}{3}$ in $\frac{a}{1-r} = 3$, we get a = 2.

Now the required sum of the cubes is $a^3 + a^3r^3 + a^3r^6 + \ldots = \frac{a^3}{1-r^3} = \frac{8}{1-\frac{1}{27}} = \frac{108}{13}$

answered May 1, 2022 · edited Aug 31, 2022 by Arjun

