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?

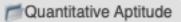
(Consider f as some arbitary function)

$$A.S = A + B$$

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

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

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



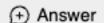
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#quantitative-aptitude

#multiple-selects

#one-mark









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 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  $f(x_a)$  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 of 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 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 times but here, one time had been subtracted. So this option is also correct. As already explain option A.

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



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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



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#one-mark

Answer

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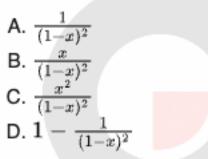




Solution: Let 
$$S = 1 + (1 + b)r + (1 + b + b^2) r^2 + .....$$
  
 $rS = r + (1 + b) r^2 + ......$   
 $(i) - (ii)$   
 $\Rightarrow (1 - r)S = 1 + br + b^2r^2 + b^3r^3 + .....$   
 $\Rightarrow S = \frac{1}{(1 - br)(1 - r)}$ 

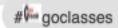
answered May 1, 2022 · selected Mar 6, 2024 by Deepak Poonia

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





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Answer

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Let 
$$S = 1 + 2x + 3x^2 + 4x^3 + ....$$

$$xS = x + 2x^2 + 3x^3 + \dots$$

(i) - (ii) 
$$\Rightarrow$$
 (1 - x) S = 1 + x + x<sup>2</sup> + x<sup>3</sup> + .......

or 
$$S = \frac{1}{(1-x)^2}$$

answered May 1, 2022



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

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

Quantitative Aptitude

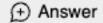
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#quantitative-aptitude

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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

$$S_n = \frac{n}{2}[a+l],$$

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



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

More than one option can be true.

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

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

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

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



#goclasses2025\_csda\_wq1

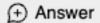


#quantitative-aptitude

#modular-arithmetic

#multiple-selects

#two-marks













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

# Option A: True

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

## 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

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

answered Mar 1, 2023



Shoto 🕜

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

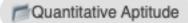
More than one option can be true.

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

B. 
$$n \mid (a-b)$$

$$C. n \mid a$$

$$D. n \mid b$$



#goclasses2025\_csda\_wq1



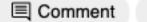
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#### Answer : A, B

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

# ATE



F

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

So 'a' can be written as:  $a = n * q_1 + r$  where  $q_1 \rightarrow Quotient$  when a is divided by 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 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  $10 \mid 47$  i also false.

Hence, Options C and D are false

answered Mar 1, 2023 · edited Jul 6, 2024 by Harsh Saini\_1





# Which of the following options is/are TRUE?

$$A. 43 \equiv -2 \pmod{5}$$

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

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

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



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"We can say that a is congruent to b modulo n, written a = b (mod n) if n l (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  $3 \cdot (5+7) = 12 \cdot (3 = 4)$  so it is correct.

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

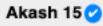
D.  $8 = -8 \pmod{5}$  so  $5 \cdot 1 \cdot (8+8) = 16 \cdot 5$ . But 16 is not divisible by 5.

#### Hence, A and B are TRUE.

answered Mar 1, 2023







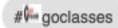
If S is the sum to infinity of a G.P. whose first term is a', then the sum of the first a

A. 
$$\mathrm{S} \Big(1 - \frac{a}{\mathrm{S}}\Big)^n$$
B.  $\mathrm{S} \Big[1 - \Big(1 - \frac{a}{\mathrm{S}}\Big)^n\Big]$ 
C.  $a \Big[1 - \Big(1 - \frac{a}{\mathrm{S}}\Big)^n\Big]$ 
D.  $\mathrm{S} \Big[1 - \Big(1 - \frac{\mathrm{S}}{a}\Big)^n\Big]$ 





#goclasses2025\_csda\_wq1



#quantitative-aptitude

#geometric-progression

#two-marks











Given that first term = a.

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

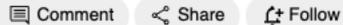
$$\Rightarrow r = 1 - \frac{a}{S}$$

$$\Rightarrow S_n = \frac{a(1-r^n)}{(1-r)}$$

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

$$\Rightarrow \mathrm{S}_n = \mathrm{S}\left[1-\left(1-rac{a}{\mathrm{S}}
ight)^n
ight]$$

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 +

A. 0

B. p-q

 $\mathsf{C}.\,p+q$ 

D. -(p+q)

Quantitative Aptitude

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Answer

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Logi

$$S_v = q$$

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

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

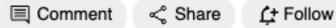
$$2a(p-q) + \{p(p-1) - q(q-1)\}d = 2q - 2p$$
  
 $2a + (p+q-1)d = -2 \longrightarrow (iii)$ 

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

# Reference:

 https://lh6.googleusercontent.com/Qerpe-hTn1BPh\_0QyQfHDxcqXEotQFnMVKJ0I3\_CtJ8PPK-WFc82FQfTlKDtJPFK2lcMxILuyQC\_NP4T8Quqg9CEDmwzfl6Ka\_cMnlYDiDXhBQNoDnpOdAUzofioxN4GW5-U1b

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



GO Classes OP

If the sum of an infinitely decreasing GP is 3, and the sum of the squares of its terms sum of the cubes of the terms is D. None of these Quantitative Aptitude # goclasses #goclasses2025\_csda\_wq1 #quantitative-aptitude #infinite-geometric-progression #two-marks Answer Comment ≪ Share ← Follow
 GO Classes G than

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

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

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

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

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

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

