CA FOUNDATION

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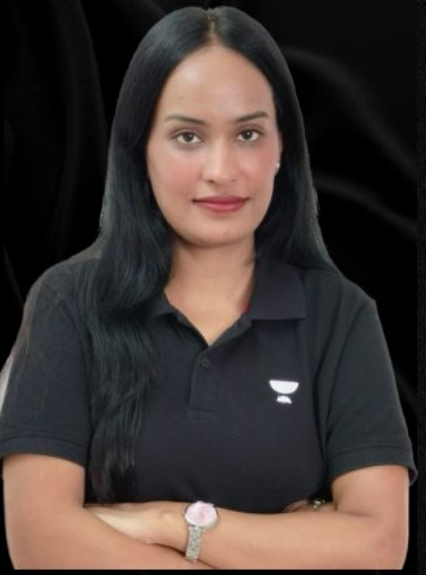

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SEQUENCE & SERIES

MATHS

CA FOUNDATION

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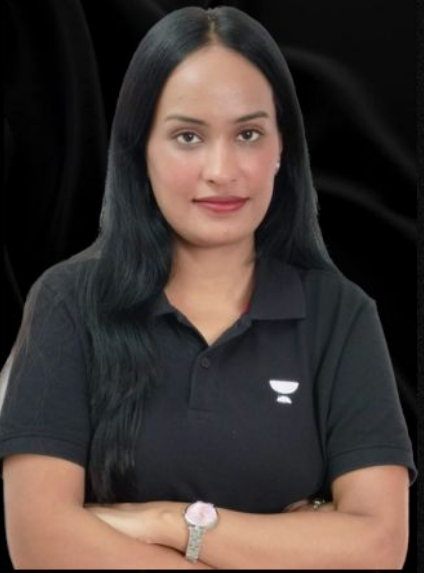

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Sequence And Series

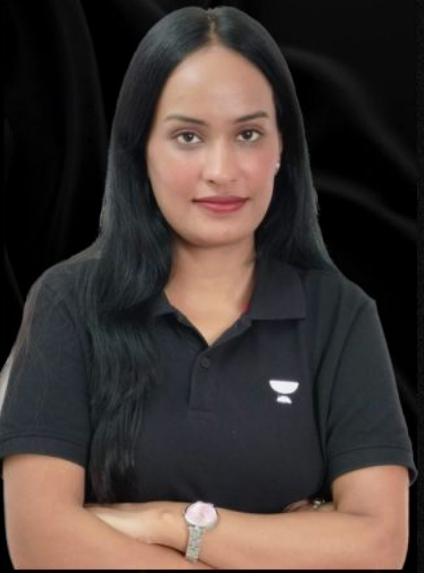
- Let us consider the following collection of numbers-

(1) 28, 2, 25, 27, ----------

(2) 2,7, 11, 19, 31, 51, ----------

MATHS

CODE : SS12



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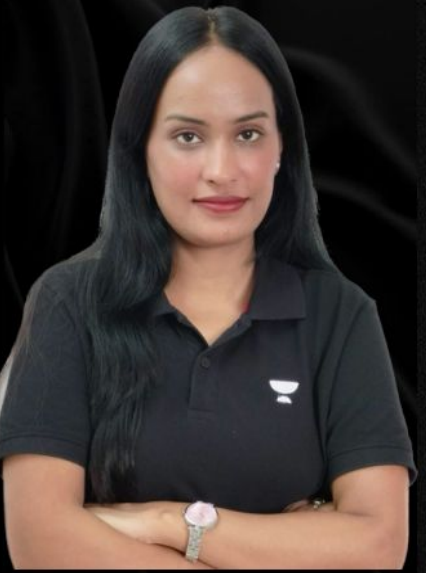
Sequence And Series

- In (1) the nos. are not arranged in a particular order.
- In (2) the nos. are in ascending order but they do not obey any rule or law. It is, therefore, not possible to indicate the number next to 51.

CA FOUNDATION

CODE : SS12



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Sequence And Series

- Let us consider the following collection of numbers-

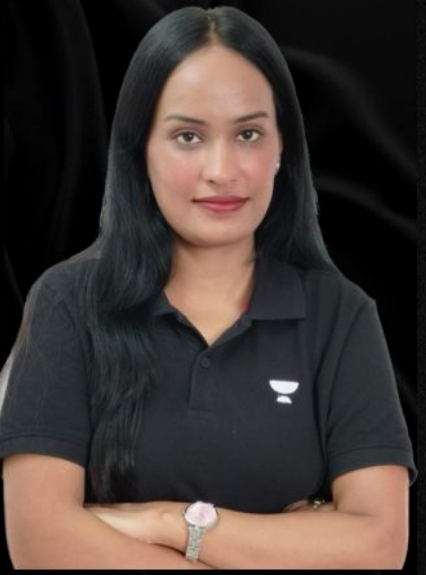
(3) 1, 2, 3, 4, 5, 6, ——————————————

(4) 20, 18, 16, 14, 12, 10, ——————————————

MATHS

CA FOUNDATION

CODE : SS12



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Sequence And Series

- In (3) we find that by adding 1 to any number, we get the next one.

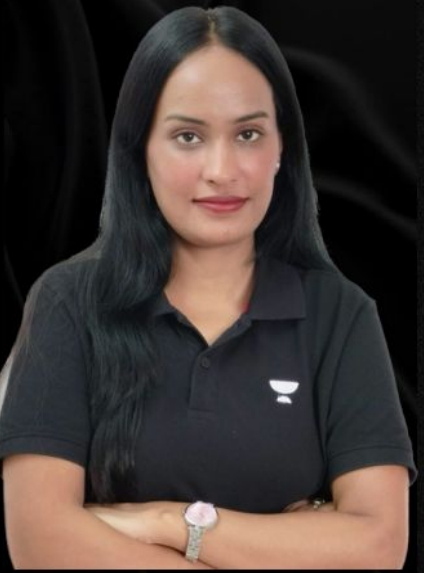
  Here the number next to 6 is 6 + 1 = 7.

- In (4) if we subtract 2 from any number we get the nos. that follows.

  Here the number next to 10 is 10 – 2 = 8.

MATHS

CODE : SS12



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Sequence And Series

- Under these circumstances, we say, the numbers in the collections (1) and (2) do not form sequences whereas the numbers in the collections (3) & (4) form sequences.

CA FOUNDATION

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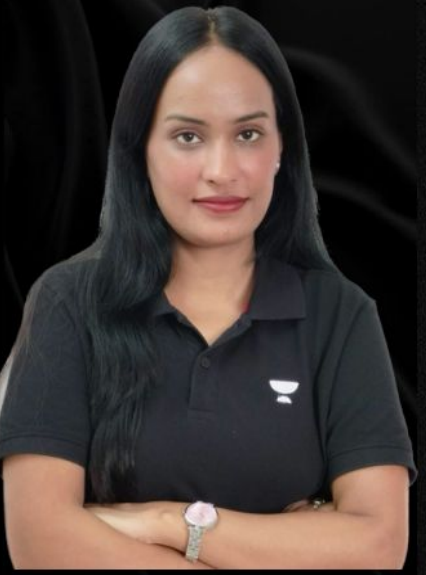

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SEQUENCE

An ordered collection of numbers $a_1, a_2, a_3, a_4, \ldots\ldots\ldots a_n \ldots\ldots\ldots$ is a sequence if according to some definite rule or law, there is a definite value of a_n called the term or element of the sequence, corresponding to any value of the natural number n.

MATHS

CA FOUNDATION

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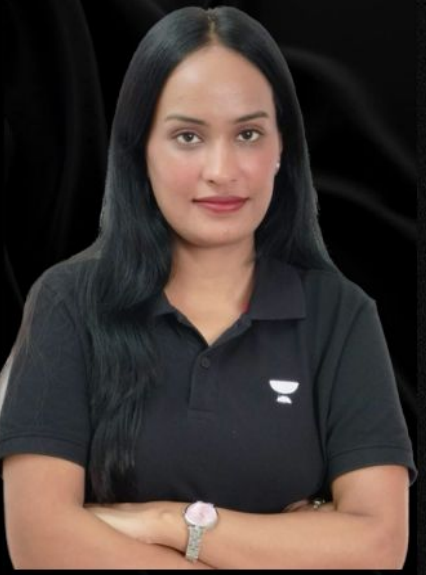

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SEQUENCE

- a_1 is the 1st term of the sequence, a_2 is the 2nd term, a_n is the nth term.

- In the nth term a_n by putting n = 1, 2, 3..... successively, we get a_1, a_2 a_3, a_4,.....

MATHS

CA FOUNDATION

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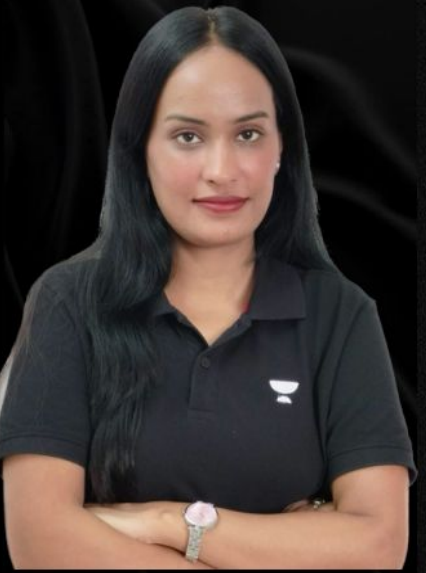

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SEQUENCE

- Thus it is clear that the nth term of a sequence is a function of the positive integer n.
- The nth term is also called the general term of the sequence.
- To specify a sequence, nth term must be known.

MATHS

CA FOUNDATION

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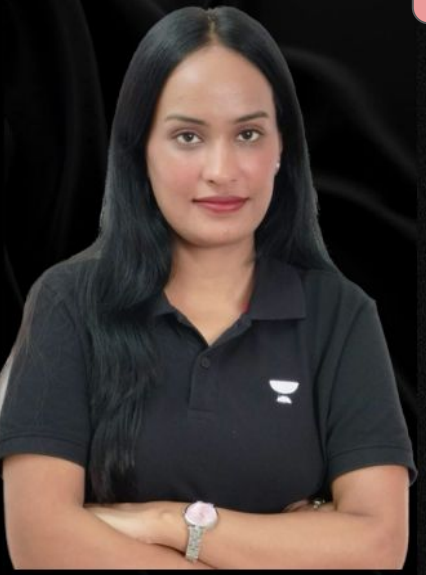

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SEQUENCE

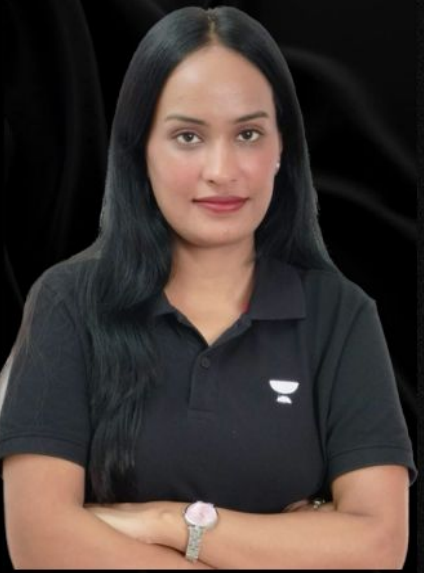
FINITE

- If the number of elements in a sequence is finite, the sequence is called finite sequence
- $a_1, a_2, a_3, a_4, \ldots\ldots\ldots, a_n$
- denoted by $\{a_i\}^n_{i=1}$

INFINITE

- If the number of elements is unending, the sequence is infinite
- $a_1, a_2, a_3, a_4, \ldots\ldots\ldots, a_n \ldots\ldots\ldots$ denoted by $\{a_n\}^\infty_{n=1}$ or simply by $\{a_n\}$

MATHS



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EXAMPLES

FINITE SEQUENCE

- A sequence of even positive integers within 12 i.e., is

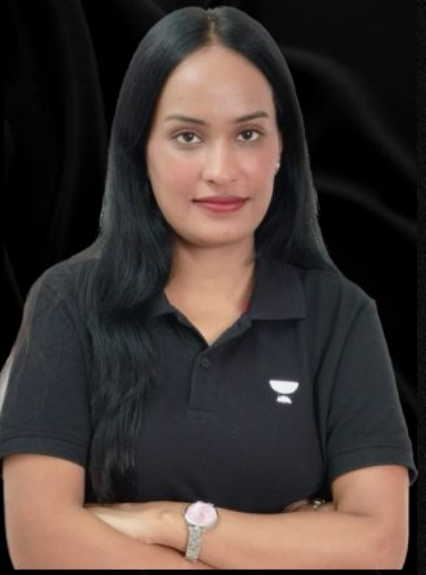
  2, 4, 6, 8, 10.

- A sequence of odd positive integers within 11 i.e., is

  1, 3, 5, 7, 9.

CA FOUNDATION

CODE : SS12



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EXAMPLES → **INFINITE SEQUENCE**

- The sequence {1/n} is 1, 1/2, 1/3, 1/4.....
- The sequence {(−1) ^{n}n} is −1, 2, −3, 4, −5,.....
- The sequence {n} is 1, 2, 3,.....
- The sequence {n / (n + 1)} is 1/2, 2/3, 3/4, 4/5.....
- A sequence of even positive integers is 2, 4, 6, ...
- A sequence of odd positive integers is 1, 3, 5, 7, ...

MATHS

CA FOUNDATION

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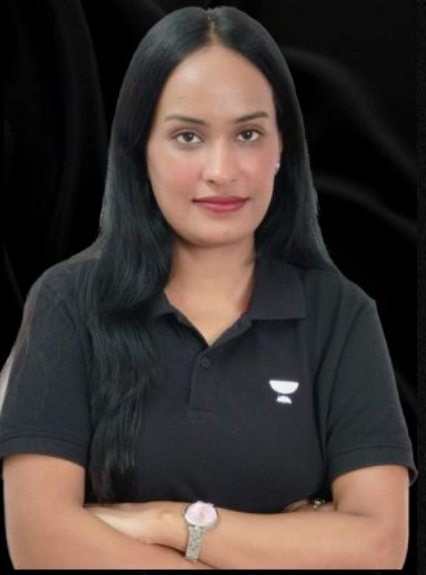

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SERIES

- An expression of the form $a_1 + a_2 + a_3 + ... + a_n + ...$

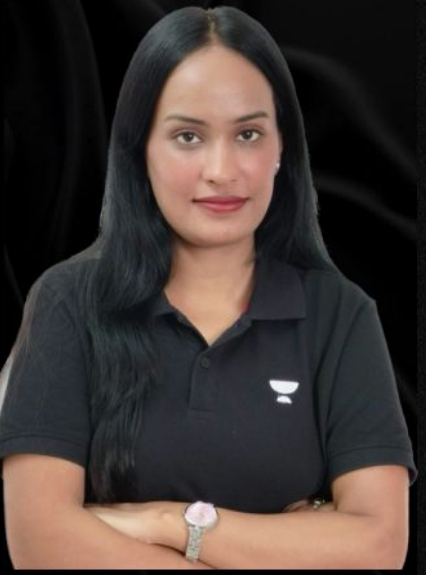
  which is the sum of the elements of the sequence $\{a_n\}$ is called a ***series.***

- If the series contains a finite number of elements, it is called a ***finite series***, otherwise called an ***infinite series***.

MATHS

CA FOUNDATION

CODE : SS12



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SERIES

- If $S_n = u_1 + u_2 + u_3 + u_4 + ... + u_n$

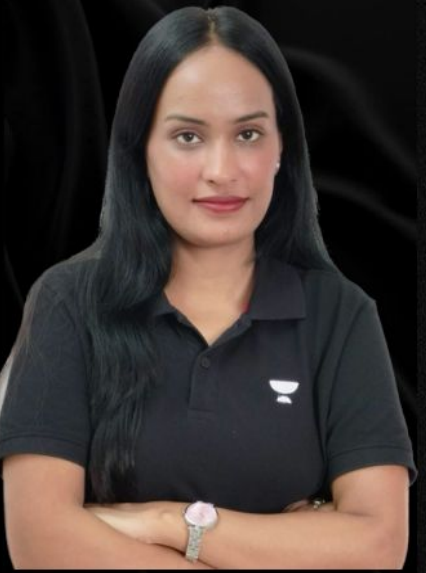
  then S_n is called the sum to n terms (or the sum of the first n terms) of the series and the term sum is denoted by the Greek letter Σ.

$$\text{Thus, } S_n = \sum_{r=1}^{n} u_r \text{ or simply by } \Sigma u_n.$$

MATHS

CA FOUNDATION

CODE : SS12



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SERIES

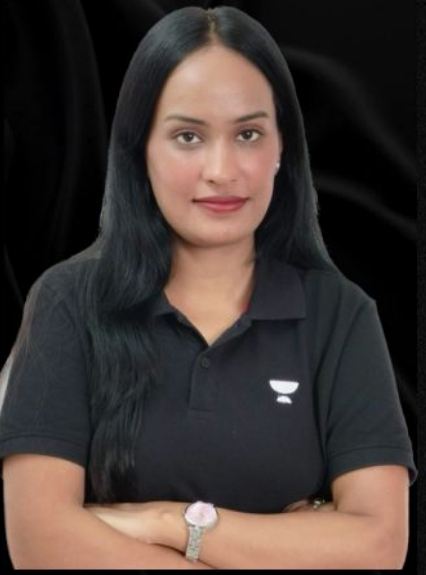
(i) 1 + 3 + 5 + 7 +..... is a series in which 1st term = 1, 2nd term = 3, and so on.

(ii) 2 – 4 + 8 – 16 +..... is also a series in which 1st term = 2, 2nd term = –4, and so on.

MATHS

CA FOUNDATION

CODE : SS12



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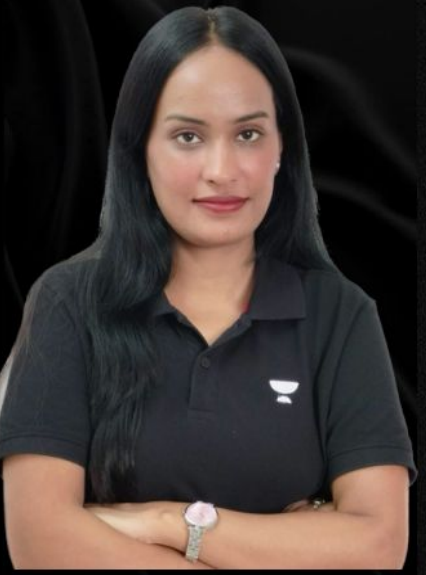
ARITHMETIC PROGRESSIONS

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

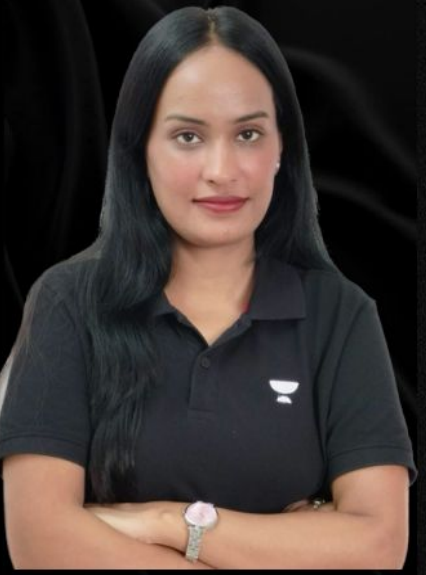
- A sequence $a_1, a_2, a_3, \ldots\ldots a_n$ is called an Arithmetic Progression (A.P.) when $a_2 - a_1 = a_3 - a_2 = a_n - a_{n-1}$.
- A. P. is a sequence in which each term is obtained by adding a constant d to the preceding term.
- This constant 'd' is called the ***common difference*** of the A.P

d can be positive , negative, zero

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

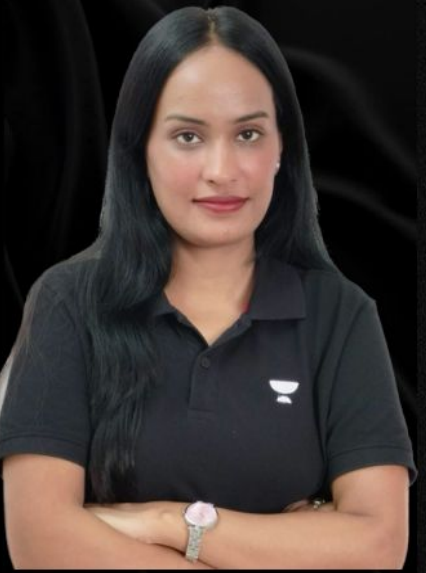
EXAMPLES

- 2,5,8,11,14,17,..... is an A.P. in which d = 3 is the common difference.
- 15,13,11,9,7,5,3,1,-1, is an A.P. in which d = -2 is the common difference.
- 2 , 2,2 ,2 ,2 .....is an A.P. in which d = 0 is the common difference.

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

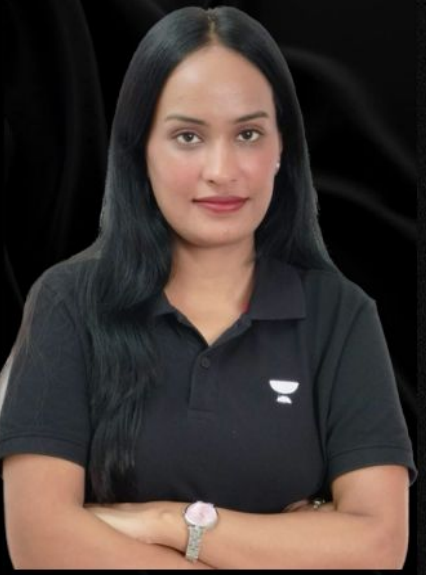
GENERAL FORM OF AP

- a, a + d , a+2d , a+ 3d ,.....

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

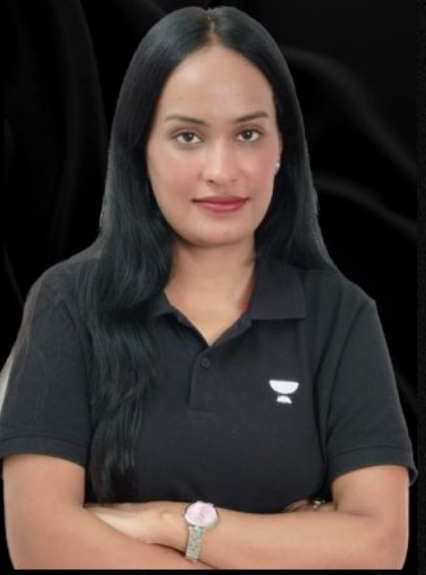
nth term of AP/ General term of AP

$$a_n = a + (n-1)\,d$$

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

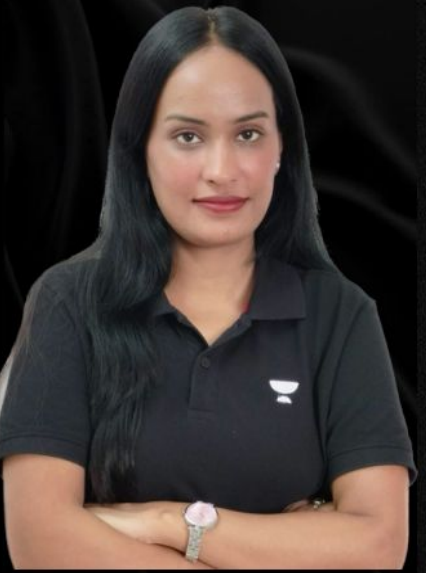
nth term from the end of an AP

$\{ l - (n - 1) d \}$

MATHS

CA FOUNDATION

CODE : SS12



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Example Find the 11th term from the end of the A.P. 10 , 7 , 4, ..., -62

MATHS

CA FOUNDATION

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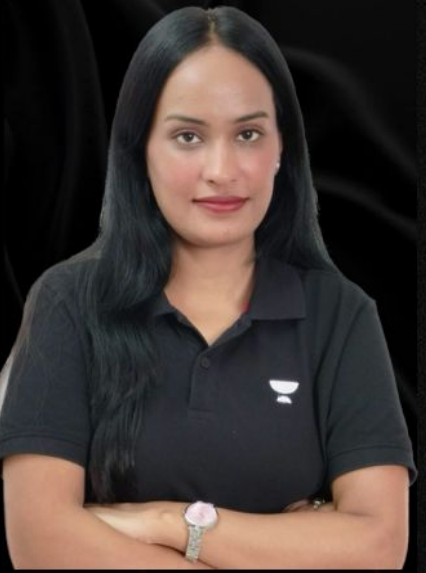

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ARITHMETIC PROGRESSIONS (AP)

- If 3 numbers a, b, c are in A.P., we say

  b − a = c − b or a + c = 2b;

  b is called the arithmetic mean between a and c.

MATHS

CA FOUNDATION

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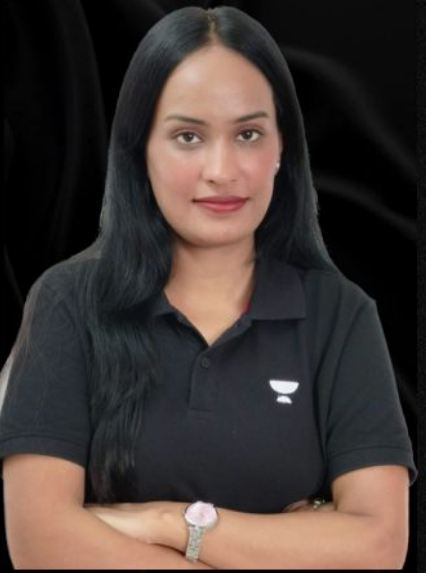

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Example Find the 7th term of the A.P. 8, 5, 2, −1, −4,.....

MATHS

CA FOUNDATION

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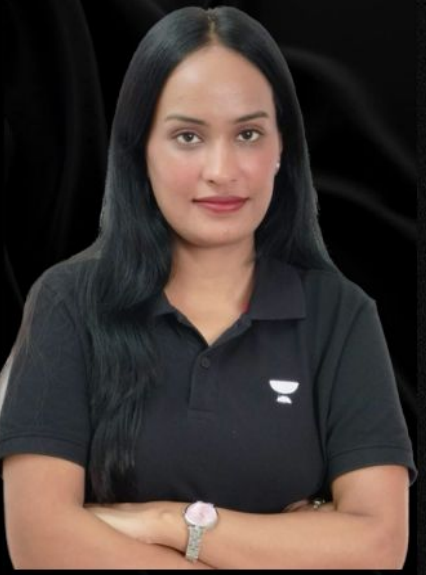

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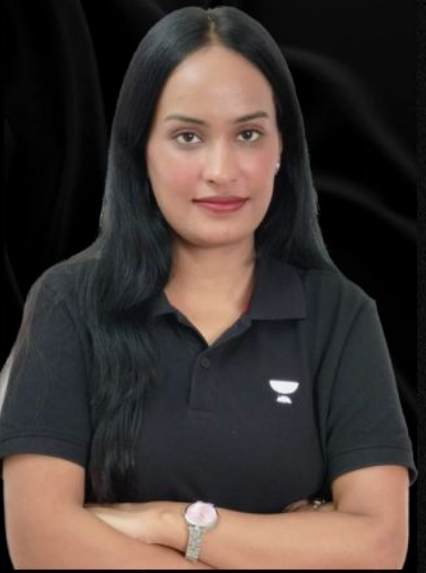
Example Which term of AP $\frac{3}{\sqrt{7}}, \frac{4}{\sqrt{7}}, \frac{5}{\sqrt{7}}$ .....is $\frac{17}{\sqrt{7}}$?

MATHS

CA FOUNDATION

CODE : SS12



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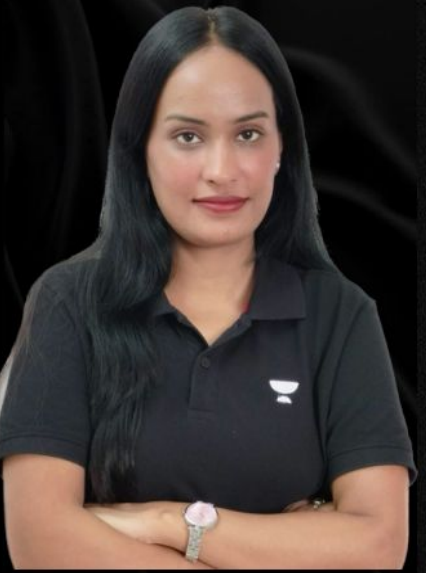
Example If 5^{th} and 12^{th} terms of an A.P. are 14 and 35 respectively, find the A.P.

MATHS

CODE : SS12



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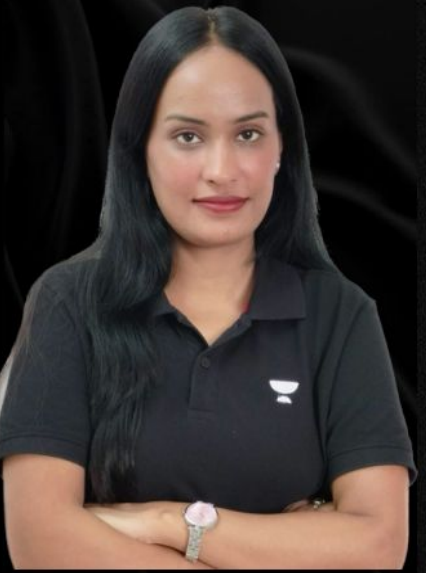
Example Divide 69 into three parts which are in A.P. and are such that the product of the first two parts is 483

CA FOUNDATION

CODE : SS12



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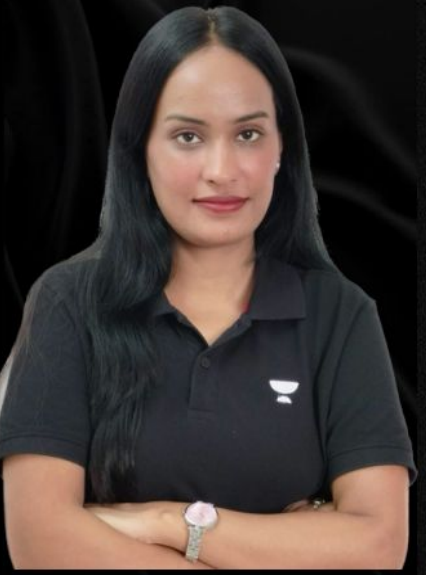
Example Find the arithmetic mean between 4 and 10.

MATHS



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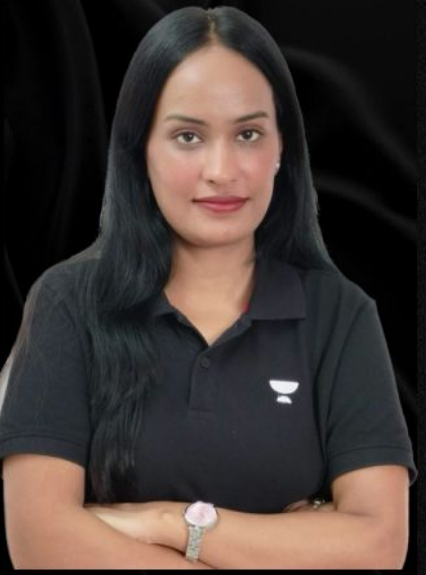
Example Insert 4 arithmetic means between 4 and 324.

4, -,-,-,-,324



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Example Insert 4 arithmetic means between 4 and 324.

4, -,-,-,-,324

CA FOUNDATION

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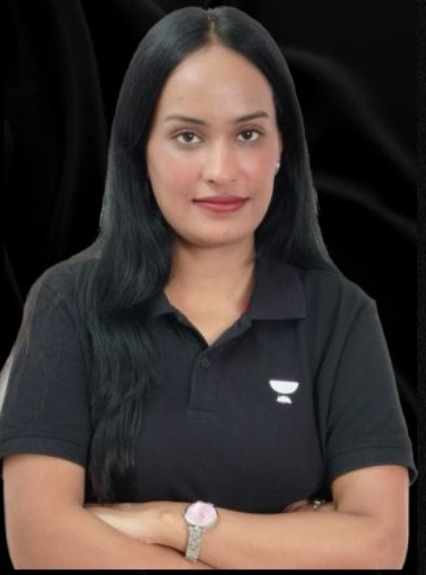

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ARITHMETIC PROGRESSIONS (AP)

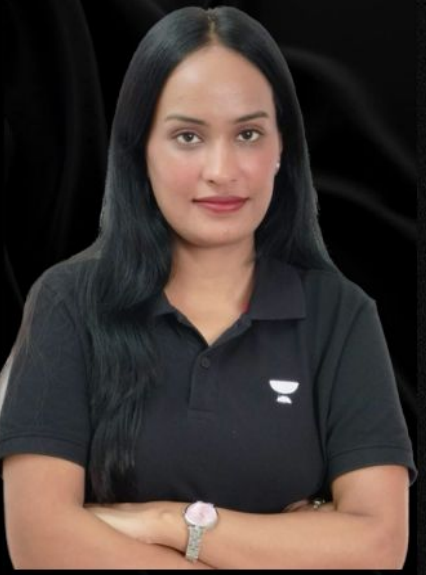
SUM OF First n terms of AP

- Let S be the Sum, a be the 1st term and l be the last term of an A.P. If the number of term is n, then t_n = l. Let d be the common difference of the A.P.
- S = n(a +l)/2
- $$S = \frac{n}{2}\{2a + (n-1)d\}$$

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

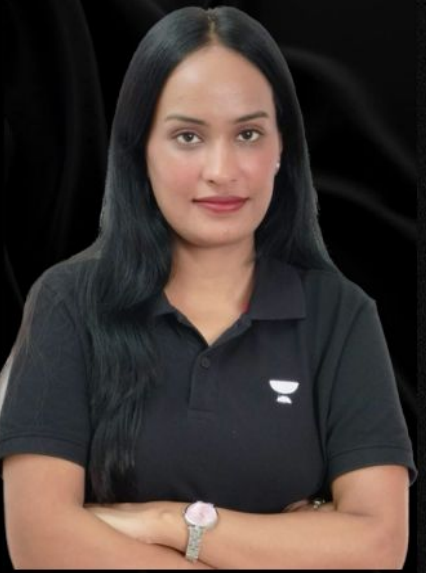
SUM OF First n terms of AP

Find the sum of 23 terms of the AP 5, 9,13,17 ,.....

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

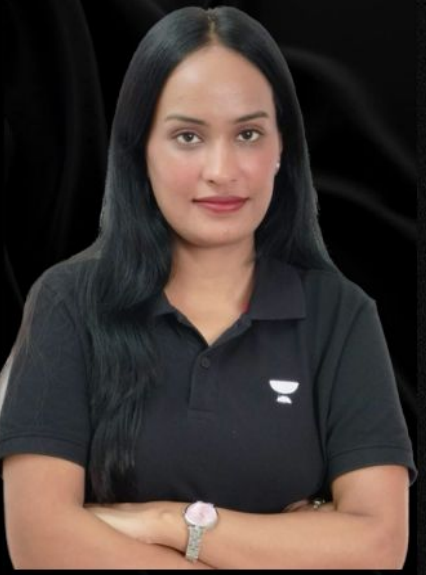
SUM OF First n terms of AP

Find the sum of the series : 5 + 13 + +21 + ……. + 181

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

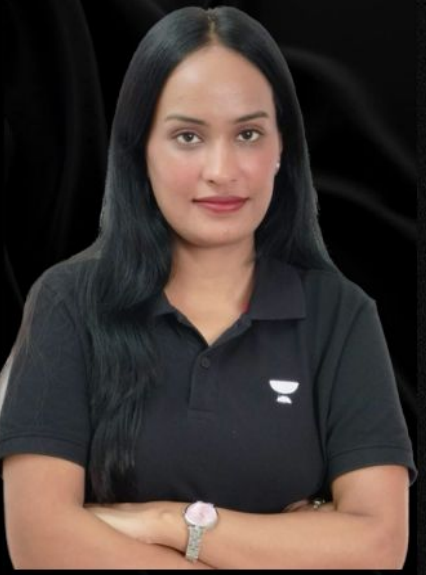
Result

$$a_n = S_n - S_{n-1}$$

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

RESULTS

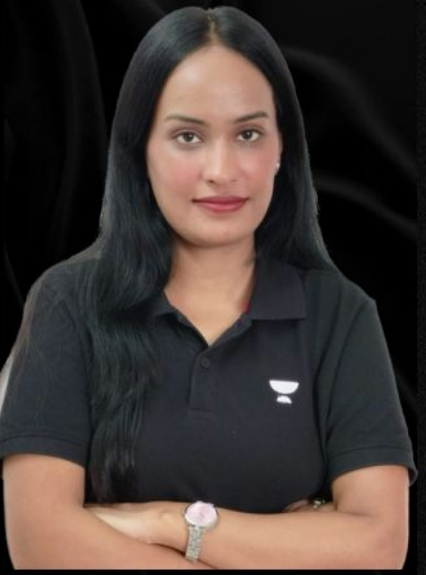
- sum of first n natural numbers is n(n + 1)/2

$$\text{i.e. } 1 + 2 + 3 + \ldots\ldots + n = \frac{n(n+1)}{2}.$$

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

RESULTS

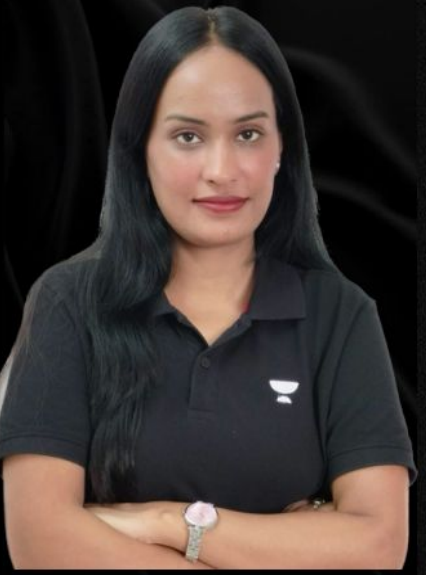
- sum of first, n odd numbers is n^2

$1 + 3 + 5 + ... + (2n - 1) = n^2$

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

RESULTS

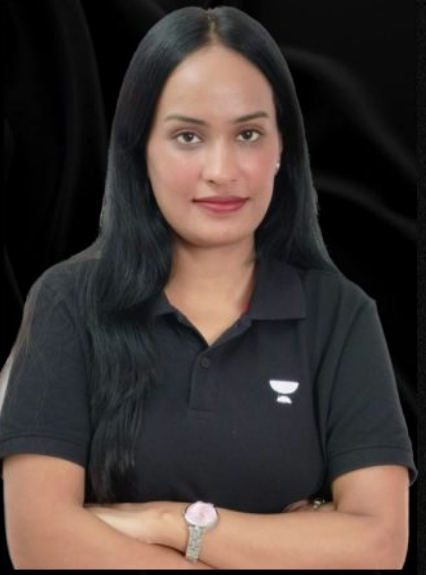
- sum of the squares of the first n natural numbers is $\frac{n(n+1)(2n+1)}{6}$

$$1^2 + 2^2 + 3^2 + \ldots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

MATHS

CA FOUNDATION

CODE : SS12



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ARITHMETIC PROGRESSIONS (AP)

RESULTS

- sum of the cubes of first n natural numbers = $\left\{\frac{n(n+1)}{2}\right\}^2$

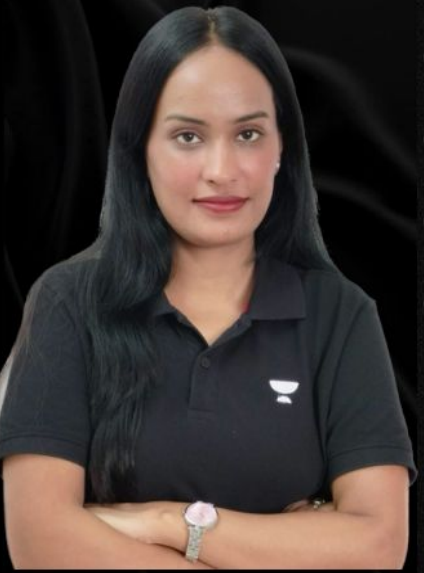
$$1^3 + 2^3 + 3^3 + ... + n^3 = \left\{\frac{n(n+1)}{2}\right\}^2$$

MATHS

EXERCISE 6(A)

CA FOUNDATION

CODE : SS12



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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 1 The nth element of the sequence 1, 3, 5, 7,..... is

(a) n

(b) 2n−1

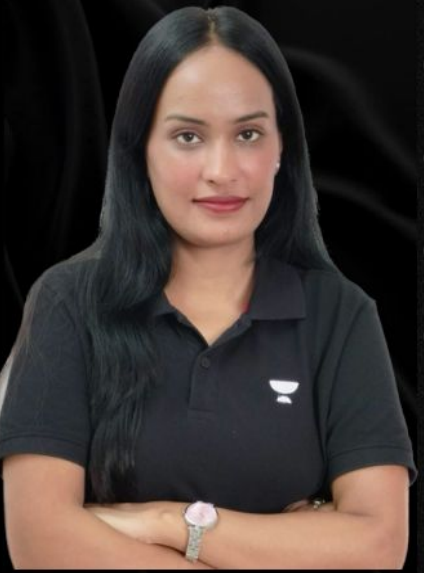
(c) 2n +1

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 2 The nth element of the sequence −1, 2, −4, 8..... is

(a) $(-1)^n 2^{n-1}$

(b) 2^{n-1}

(c) 2^n

(d) none of these

MATHS

CA FOUNDATION

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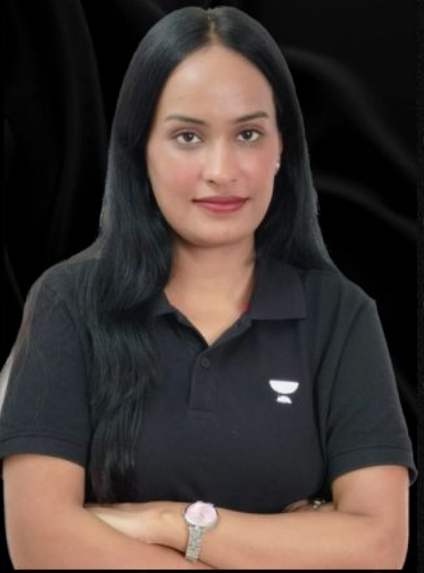

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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 3 $\sum_{i=4}^{7} \sqrt{2i-1}$ can be written as

(a) $\sqrt{7}+\sqrt{9}+\sqrt{11}+\sqrt{13}$

(b) $2\sqrt{7}+2\sqrt{9}+2\sqrt{11}+2\sqrt{13}$

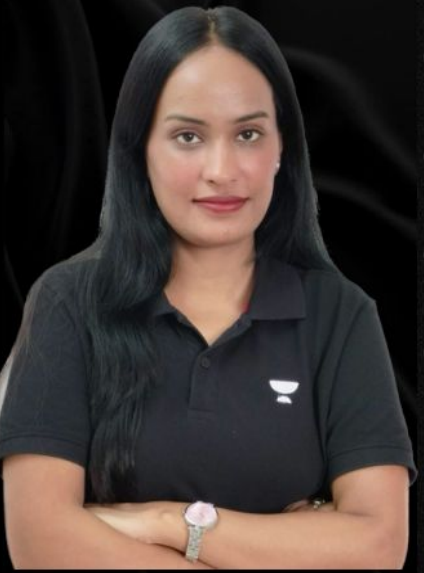
(c) $2\sqrt{7}+2\sqrt{9}+2\sqrt{11}+2\sqrt{13}$

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



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Choose the most appropriate option (a), (b), (c) or (d)

Que. 4 The sum to ∞ of the series −5, 25, −125, 625, ... can be written as

(a) $\sum_{k=1}^{\infty}(-5)^k$

(b) $\sum_{k=1}^{\infty}5^k$

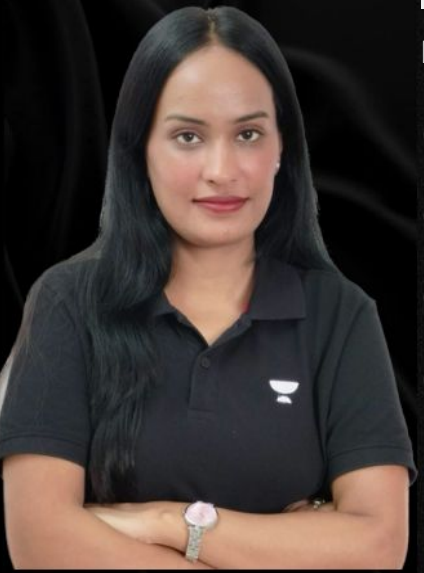
(c) $\sum_{k=1}^{\infty}-5^k$

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 5 The first three terms of sequence when nth term t_n is $n^2 - 2n$ are

(a) -1, 0, 3

(b) 1, 0, 2

(c) -1, 0, -3

(d) none of these

MATHS

CA FOUNDATION

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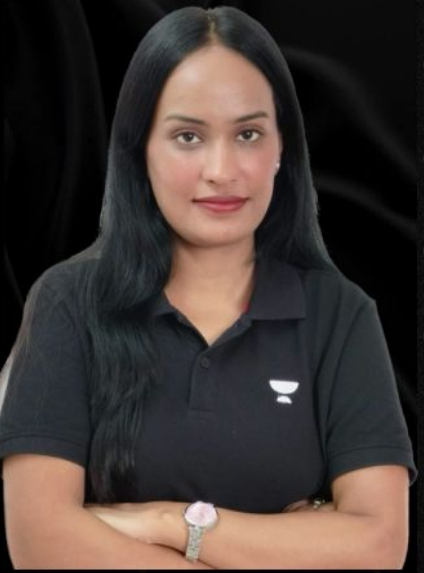


Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 6 Which term of the progression -1, -3, -5, ... is -39

(a) 21^{st}

(b) 20^{th}

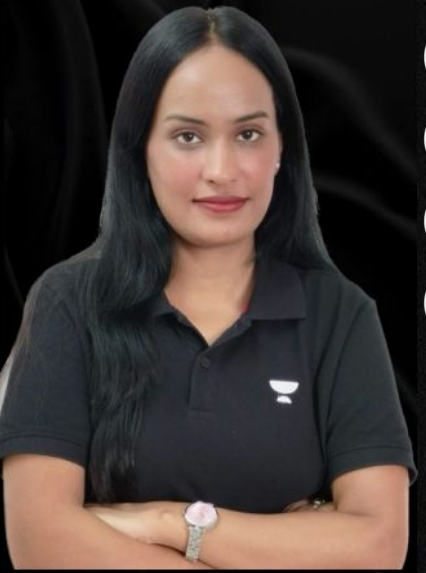
(c) 19^{th}

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 7 The value of x such that 8x + 4, 6x – 2, 2x + 7 will form an AP is

(a) 15

(b) 2

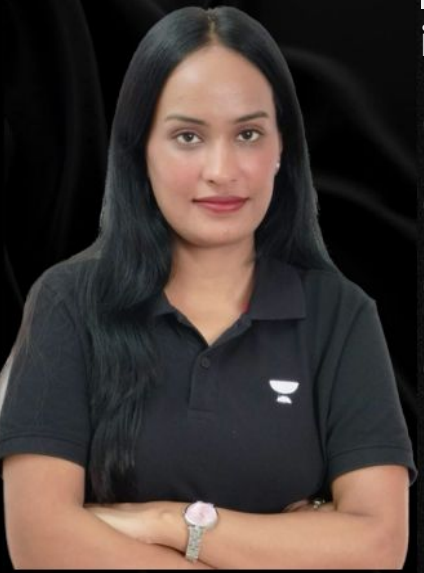
(c) 15/2

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



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Choose the most appropriate option (a), (b), (c) or (d)

Que. 8 The m^{th} term of an A. P. is n and n^{th} term is m. The r^{th} term of it is

(a) m + n + r

(b) n + m − 2r

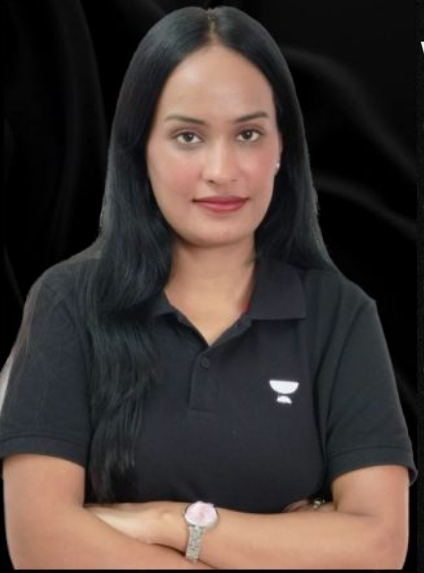
(c) m + n + r/2

(d) m + n − r

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 9 The number of the terms of the series $10 + 9\frac{2}{3} + 9\frac{1}{3} + 9 + \ldots\ldots$ will amount to 155 is

(a) 30

(b) 31

(c) 32

(d) none of these

MATHS

CA FOUNDATION

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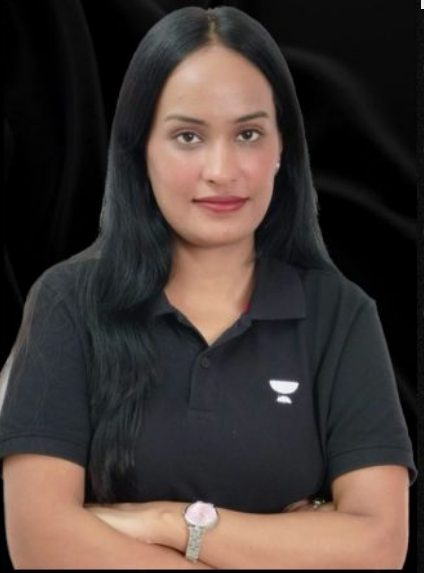


Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 10 The nth term of the series whose sum to n terms is $5n^2 + 2n$ is

(a) 3n – 10

(b) 10n – 2

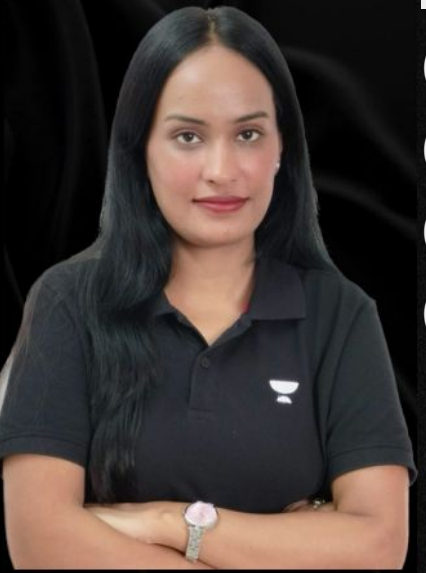
(c) 10n – 3

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 11 The 20th term of the progression 1, 4, 7, 10 ..... is

(a) 58

(b) 52

(c) 50

(d) none of these

MATHS

CA FOUNDATION

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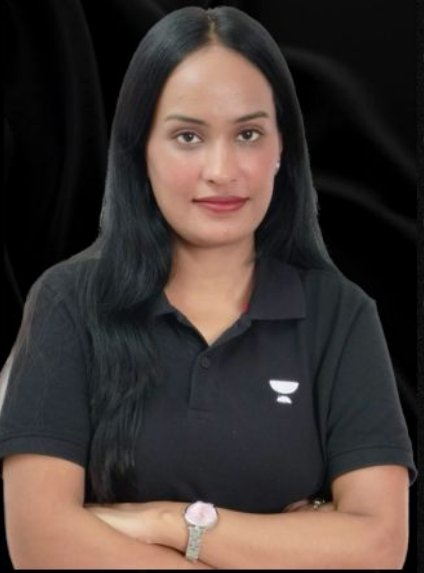

Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 12 The last term of the series 5, 7, 9, ... to 21 terms is

(a) 44

(b) 43

(c) 45

(d) none of these

MATHS

CA FOUNDATION

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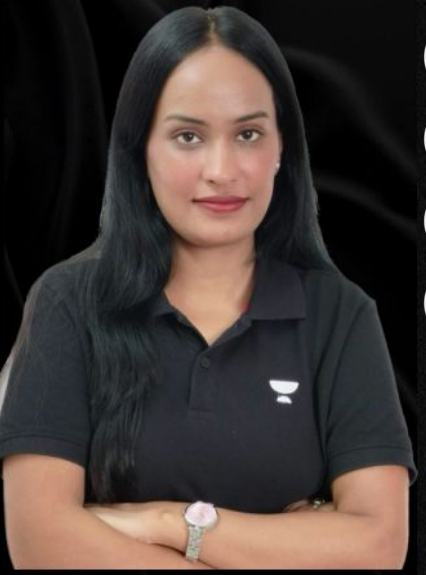


Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 13 The last term of the A.P. 0.6, 1.2, 1.8, ... to 13 terms is

(a) 8.7

(b) 7.8

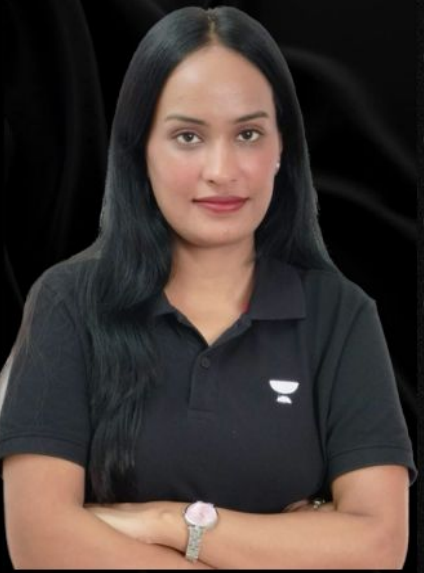
(c) 7.7

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 14 The sum of the series 9, 5, 1, ... to 100 terms is

(a) -18,900

(b) 18,900

(c) 19,900

(d) none of these

MATHS

CA FOUNDATION

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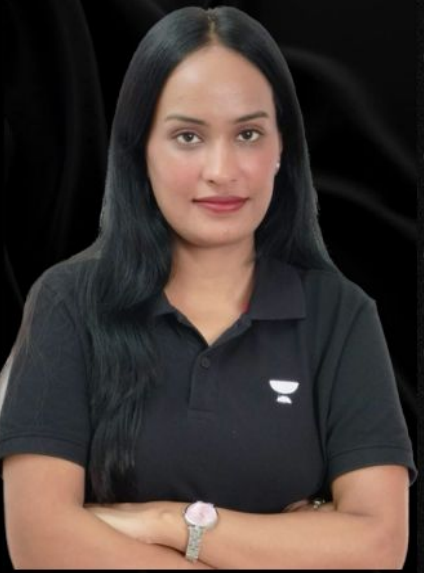


Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 15 The two arithmetic means between −6 and 14 is

(a) 2/3, 1/3

(b) 2/3, $7\frac{1}{3}$

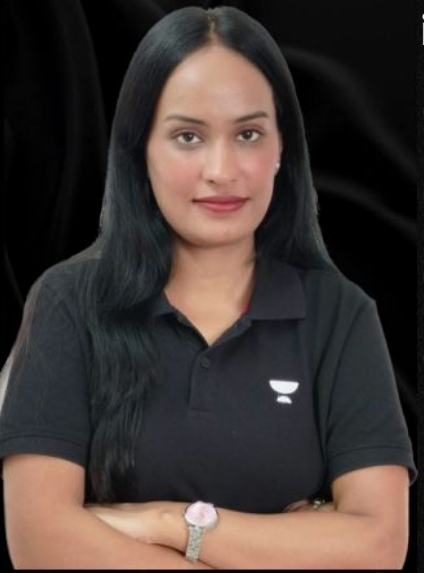
(c) −2/3, $-7\frac{1}{3}$

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 16 The sum of three integers in AP is 15 and their product is 80. The integers are

(a) 2,8,5

(b) 8,2,5

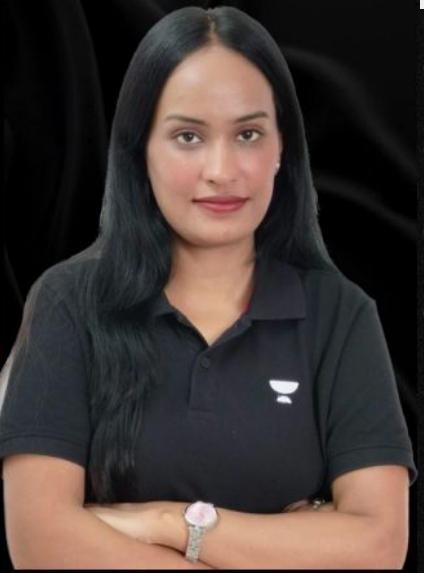
(c) 2,5,8

(d) 8,5,2

MATHS

CA FOUNDATION

CODE : SS12



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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 17 The sum of n terms of an AP is $3n^2 + 5n$. The series is

(a) 8, 14, 20, 26

(b) 8, 22, 42, 68

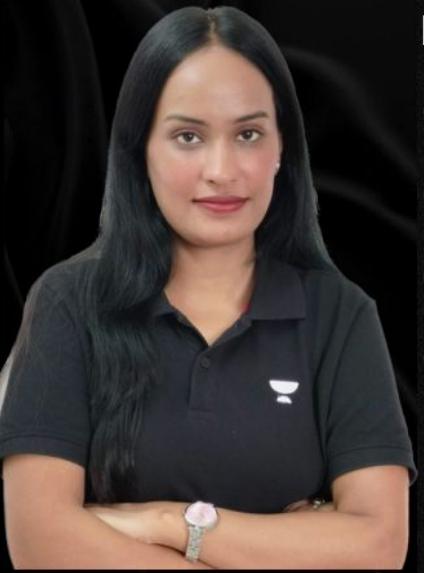
(c) 22, 68, 114, ...

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



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Choose the most appropriate option (a), (b), (c) or (d)

Que. 18 The number of numbers between 74 and 25,556 divisible by 5 is

(a) 5,090

(b) 5,097

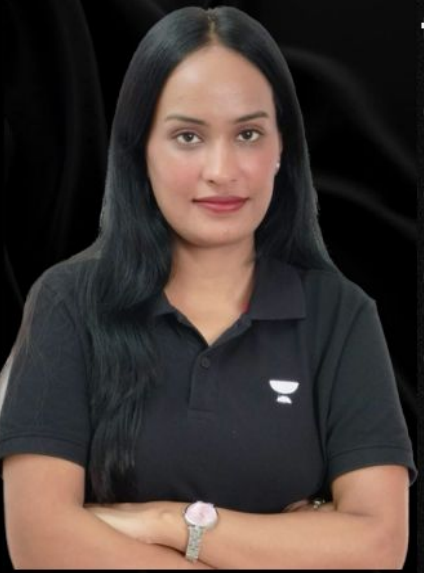
(c) 5,095

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 19 The pth term of an AP is (3p – 1)/6. The sum of the first n terms of the AP is

(a) n (3n+1)

(b) n(3n+1)/12

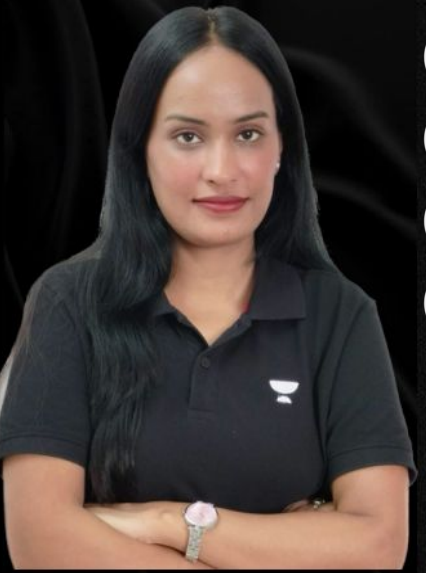
(c) n/12 (3n–1)

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 20 The arithmetic mean between 33 and 77 is

(a) 50

(b) 45

(c) 55

(d) none of these

MATHS

CA FOUNDATION

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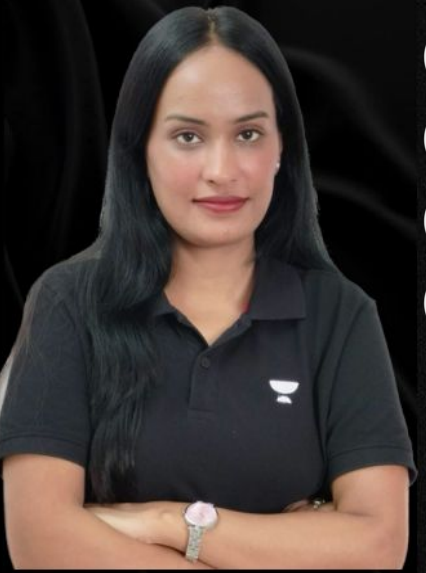

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Choose the most appropriate option (a), (b), (c) or (d)

Que. 21 The 4 arithmetic means between -2 and 23 are

(a) 3, 13, 8, 18

(b) 18, 3, 8, 13

(c) 3, 8, 13, 18

(d) none of these

MATHS

CA FOUNDATION

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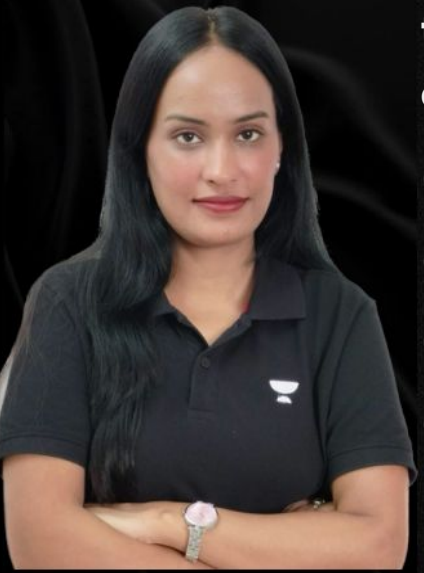

Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 22 The first term of an A.P is 14 and the sums of the first five terms and the first ten terms are equal in magnitude but opposite in sign. The 3rd term of the AP is

(a) $6\frac{4}{11}$

(b) 6

(c) 4/11

(d) none of these

MATHS

CA FOUNDATION

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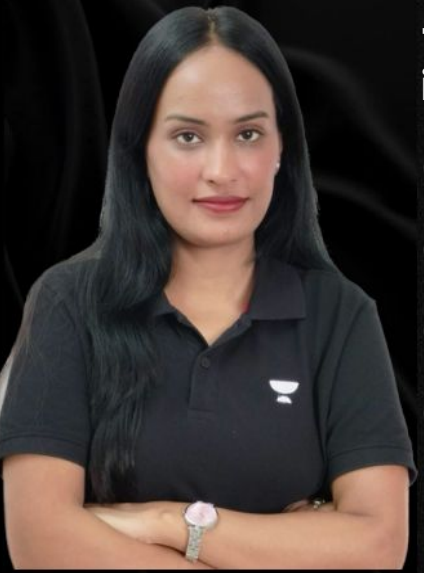

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Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 23 The sum of a certain number of terms of an AP series −8, −6, −4..... is 52. The number of terms is

(a) 12

(b) 13

(c) 11

(d) none of these

MATHS

CA FOUNDATION

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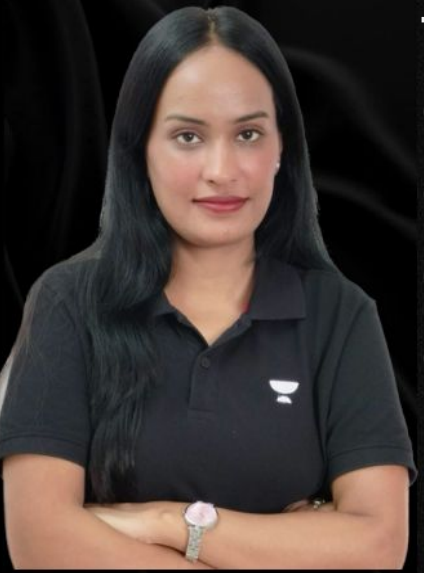

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Choose the most appropriate option (a), (b), (c) or (d)

Que. 24 The first and the last term of an AP are −4 and 146. The sum of the terms is 7171. The number of terms is

(a) 101

(b) 100

(c) 99

(d) none of these

MATHS

CA FOUNDATION

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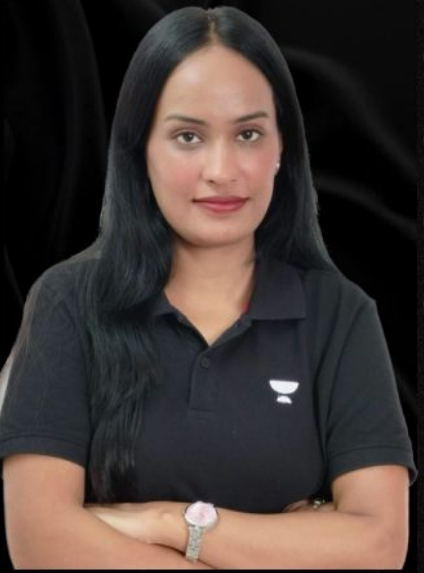

Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que. 25 The sum of the series $3\frac{1}{2} + 7 + 10\frac{1}{2} + 14 + \ldots$ to 17 terms is

(a) 530

(b) 535

(c) $535\frac{1}{2}$

(d) none of these

MATHS

CA FOUNDATION

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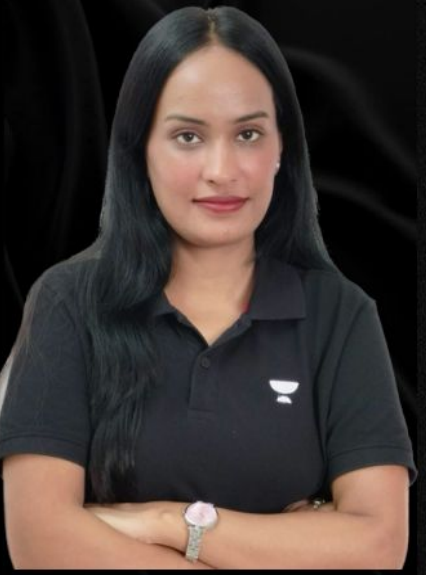

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GEOMETRIC PROGRESSIONS

MATHS

CA FOUNDATION

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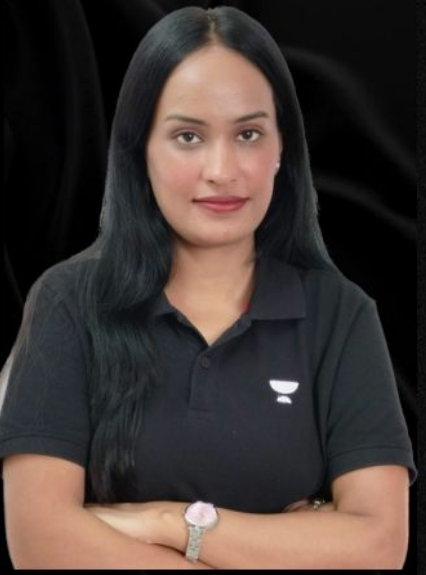

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GEOMETRIC PROGRESSIONS (GP)

- A sequence $a_1, a_2, a_3, \ldots\ldots\ldots\ldots, a_n$ is called geometric progression , if each term is nonzero and $\frac{a_{k+1}}{a_k} = r$ (constant) for all $k \geq 1$
- The constant ratio is called its common ratio .

MATHS

CA FOUNDATION

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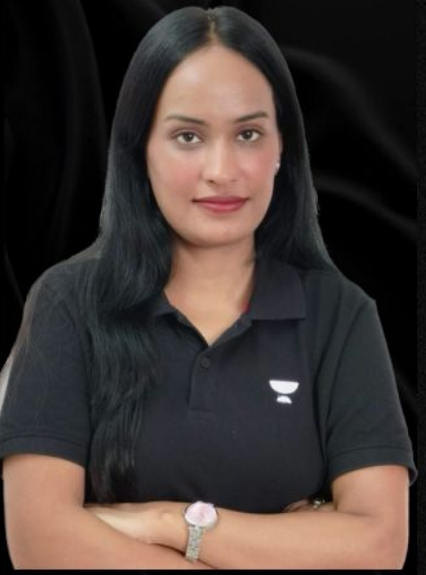

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GEOMETRIC PROGRESSIONS (GP)

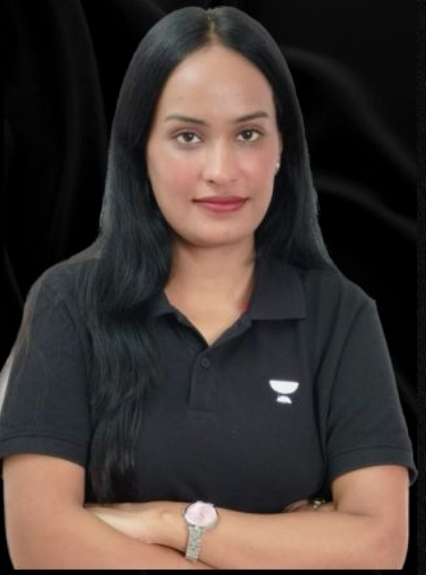
- In a GP we usually denote the first term by a , common ratio by r and the nth term by a_n

  The nth term of a GP is called its general term

MATHS

CA FOUNDATION

CODE : SS12



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GEOMETRIC PROGRESSIONS (GP)

Example

- In 5, 15, 45, 135, ... common ratio is 15/5 = 3
- In 1, 1/2, 1/4, 1/9 ... common ratio is (1/2) /1 = 1/2
- In 2,- 6, 18, -54, ... common ratio is (-6) / 2 = -3

MATHS

CA FOUNDATION

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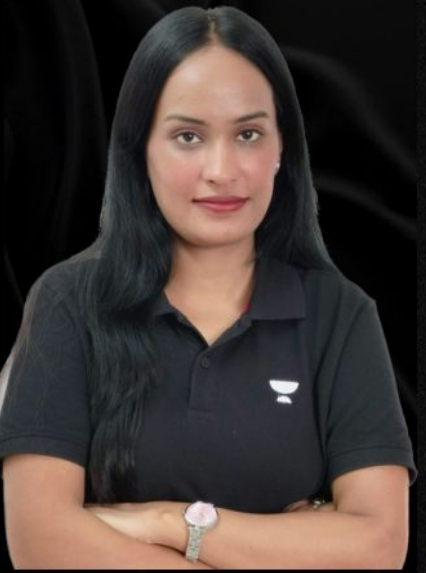

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GEOMETRIC PROGRESSIONS (GP)

Example

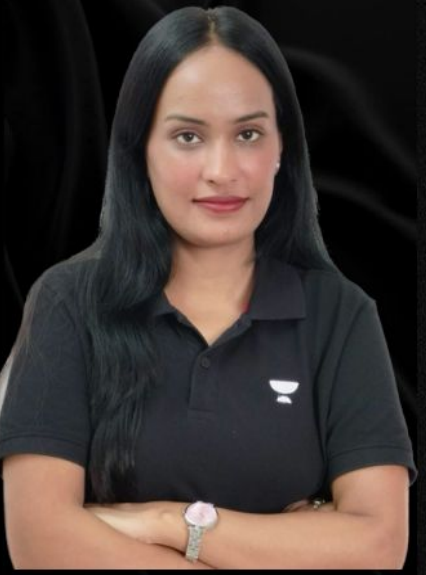
- 1 + 4 + 16 + 64 + ...

GEOMETRIC SERIES

MATHS

CA FOUNDATION

CODE : SS12



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GEOMETRIC PROGRESSIONS (GP)

nth term of a GP

- Let us consider a GP with first term a and common ratio r

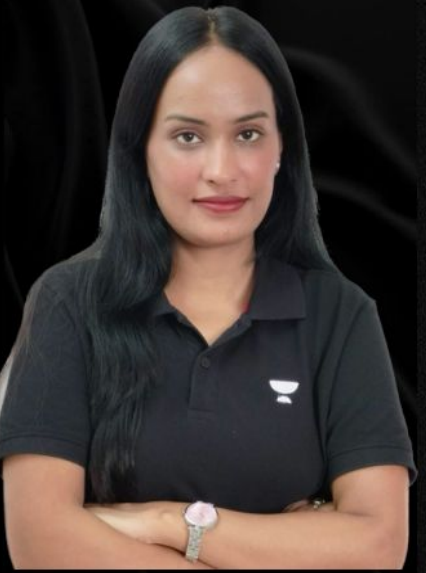
$a , ar , ar^2 , ar^3, \ldots\ldots\ldots\ldots ar^{n-1}$

$$a_n = ar^{n-1}$$

MATHS

CA FOUNDATION

CODE : SS12



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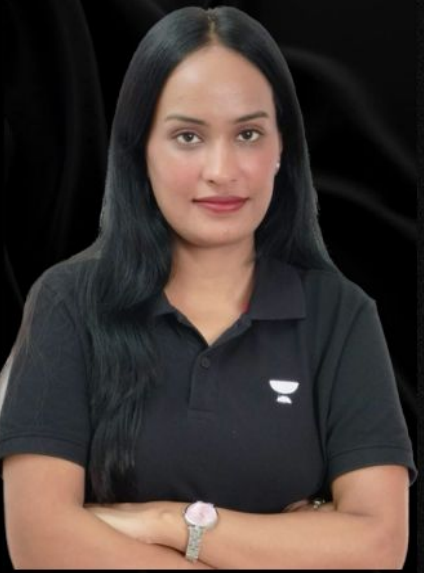
GEOMETRIC PROGRESSIONS (GP)

Example 1 If a, ar, ar^2, ar^3, .. be in G.P. Find the common ratio.

MATHS

CODE : SS12



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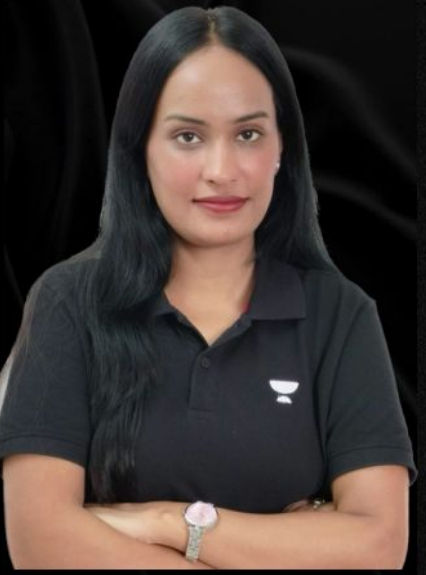
GEOMETRIC PROGRESSIONS (GP)

Example 2 Which term of the progression 1, 2, 4, 8,... is 256?

CA FOUNDATION

CODE : SS12



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GEOMETRIC PROGRESSIONS (GP)

nth term from the end of an GP

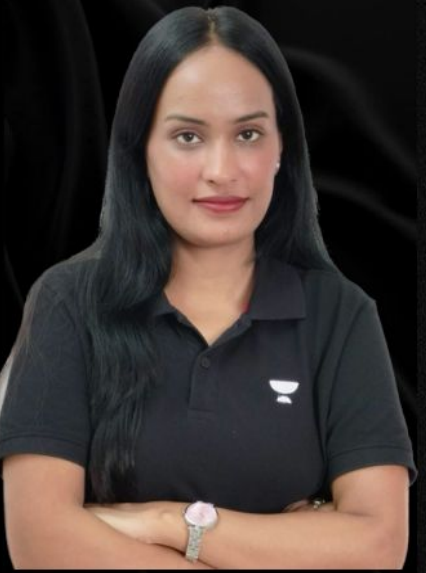
- nth term from the end of a GP with first term a , common ratio r and the last term l is given by

$$\frac{l}{r^{(n-1)}}$$

MATHS

CA FOUNDATION

CODE : SS12



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Sharma

GEOMETRIC PROGRESSIONS (GP)

nth term from the end of an GP

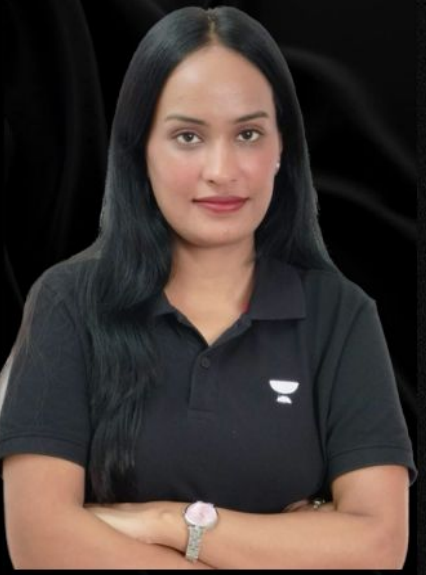
- Find the 8th term from the end of the GP

  3 , 6, 12 ,24 ,....., 12288.

MATHS

CA FOUNDATION

CODE : SS12



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GEOMETRIC PROGRESSIONS (GP)

GEOMETRIC MEAN

- If a, b, c are in G.P

  we get ,

  $b/a = c/b \Rightarrow b^2 = ac$,

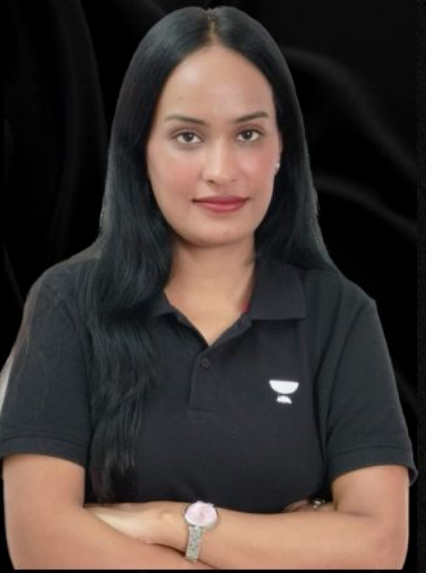
  $b = \sqrt{ac}$

  b is called the geometric mean between a and c .

MATHS

CA FOUNDATION

CODE : SS12



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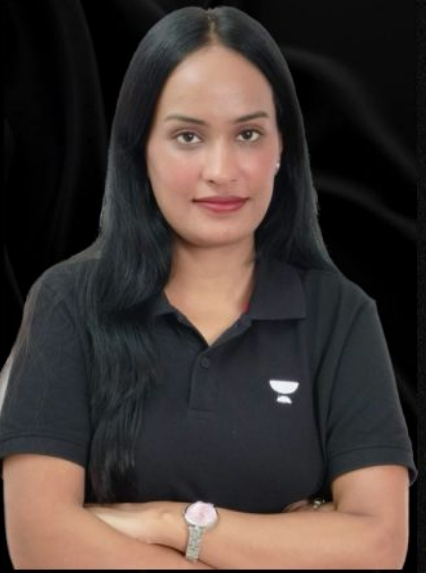
Example1 Insert 3 geometric means between 1/9 and 9.

MATHS

CA FOUNDATION

CODE : SS12



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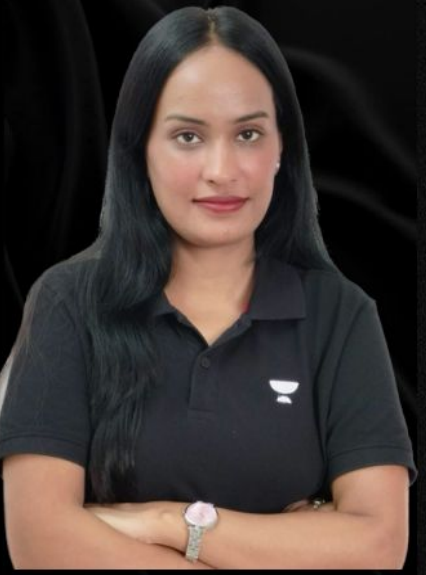
Example 2 Find the G.P where 4^{th} term is 8 and 8^{th} term is 128/625.

MATHS

CA FOUNDATION

CODE : SS12



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GEOMETRIC PROGRESSIONS (AP)

SUM OF n TERMS OF A GP

Let a be the first term and r be the common ratio. So the first n terms are a, ar, ar^2, ... ar^{n-1}.

If S be the sum of n terms,

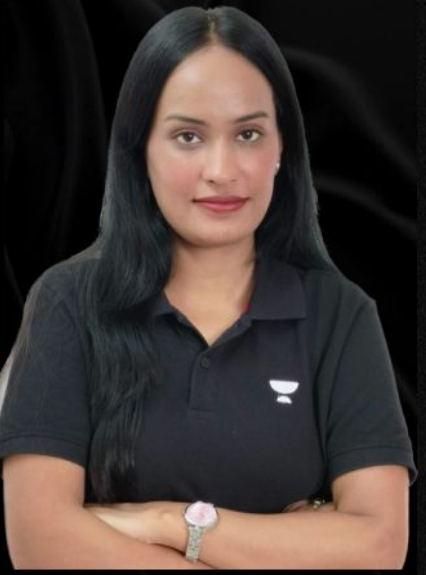
$$S_n = a + ar + ar^2 + \ldots\ldots + ar^{n-1}$$

$$S_n = \begin{cases} na, \text{ when } r = 1; \\ \dfrac{a(1-r^n)}{(1-r)}, \text{ when } r < 1; \\ \dfrac{a(r^n-1)}{(r-1)}, \text{ when } r > 1. \end{cases}$$

MATHS

CA FOUNDATION

CODE : SS12



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GEOMETRIC PROGRESSIONS (AP)

SUM OF n TERMS OF A GP

If a GP contains n terms with first term $= a$, common ratio $= r$ and last term $= l$, then

$$l = ar^{n-1}. \quad \ldots (i)$$

Case 1 When $r < 1$, we have

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

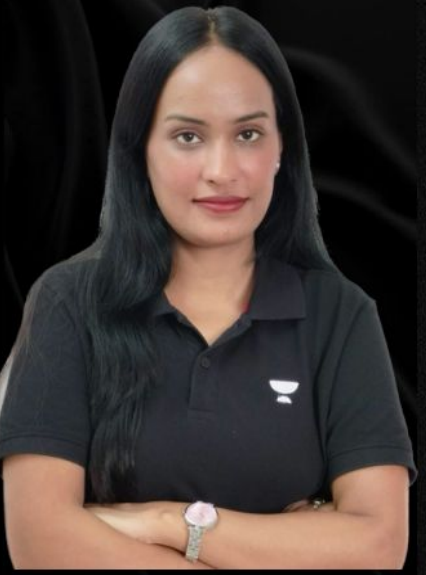
Case 2 When $r > 1$, we have

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

MATHS

CA FOUNDATION

CODE : SS12



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GEOMETRIC PROGRESSIONS (AP)

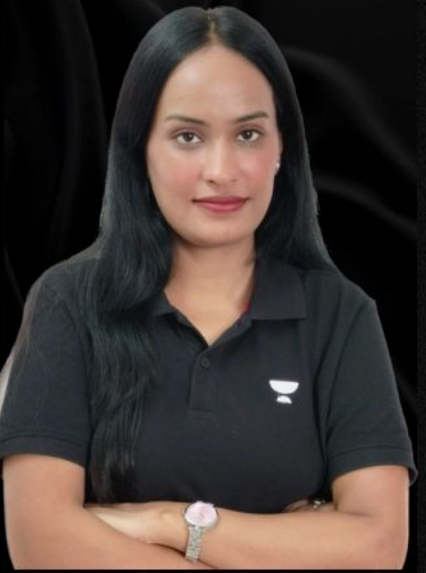
SUM OF INFINITE GEOMETRIC SERIES

$$S_{\infty} = \frac{a}{1-r}, \text{ if } -1<r<1.$$

MATHS

CA FOUNDATION

CODE : SS12



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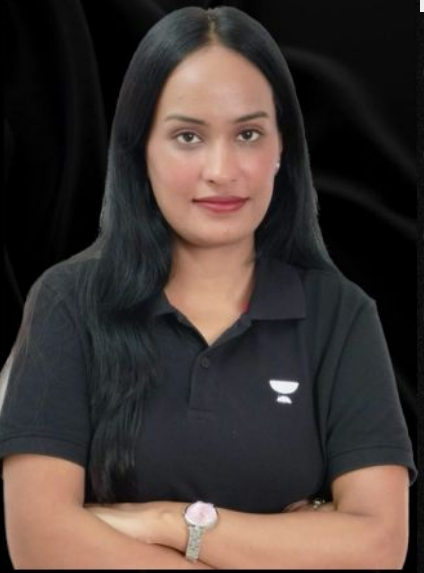
Example Find the sum of 1 + 2 + 4 + 8 + ... to 8 terms.,

MATHS

EXERCISE 6 (B)

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que1. The 7^{th} term of the series 6, 12, 24,.....is

(a) 384

(b) 834

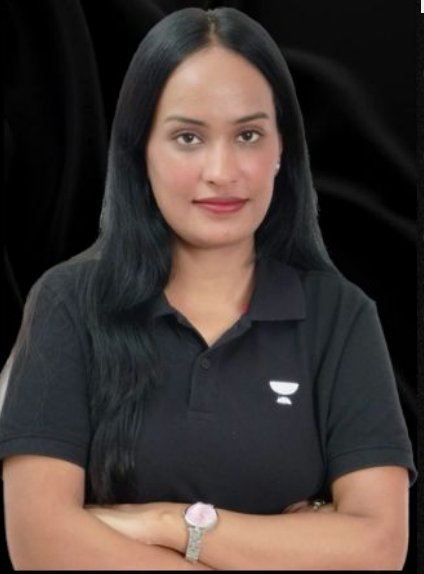
(c) 438

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 2. t_8 of the series 6, 12, 24,..is

(a) 786

(b) 768

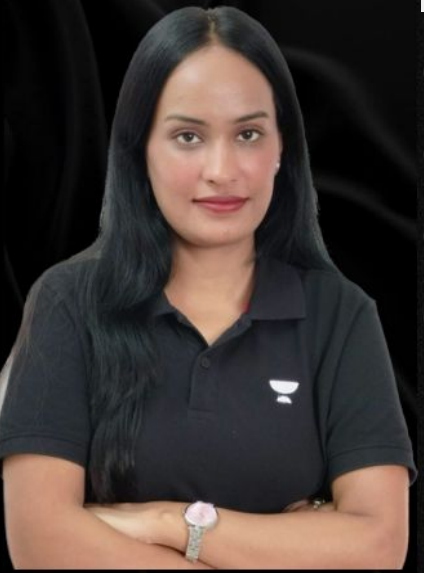
(c) 867

(c) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que3. t_{12} of the series -128, 64, -32, ... is

(a) - 1/16

(b) 16

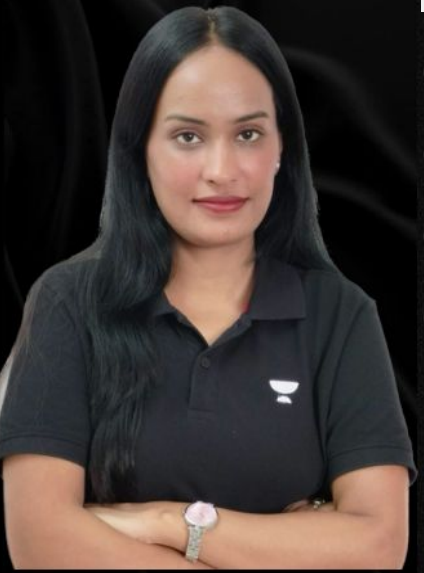
(c) 1/16

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 4. The 4^{th} term of the series 0.04, 0.2, 1, ... is

(a) 0.5

(b) 1/2

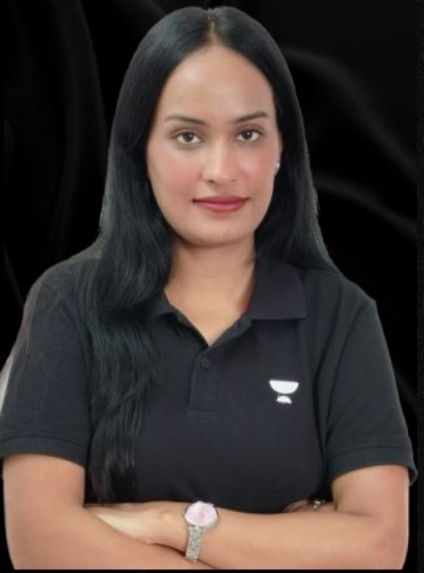
(c) 5

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 5. The last term of the series 1, 2, 4,.... to 10 terms is

(a) 512

(b) 256

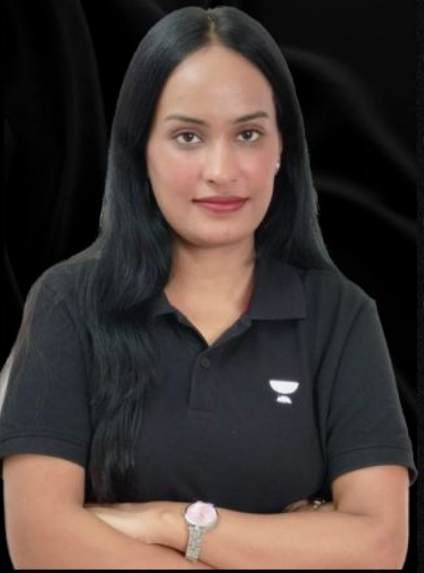
(c) 1024

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 6. The last term of the series 1, −3, 9, −27 up to 7 terms is

(a) 297

(b) 729

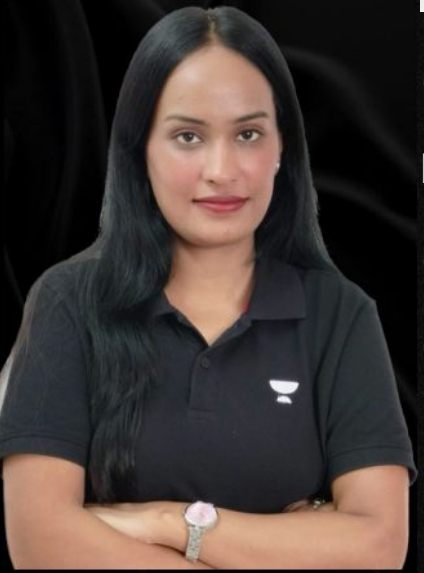
(c) 927

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 7. The last term of the series x^2, x, 1, ... to 31 terms is

(a) x^{28}

b) 1/x

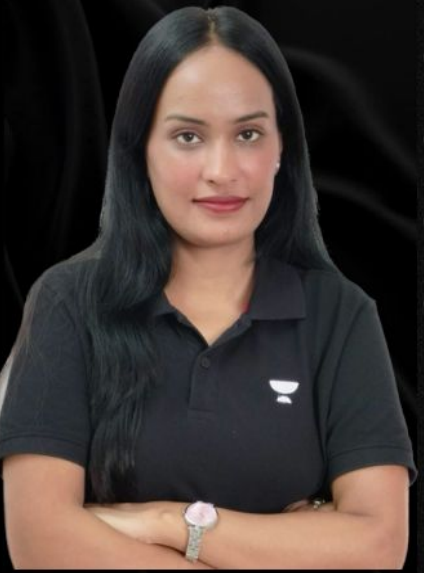
(c) $1/x^{28}$

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 8. The sum of the series −2, 6, −18, ... to 7 terms is

(a) −1094

(b) 1094

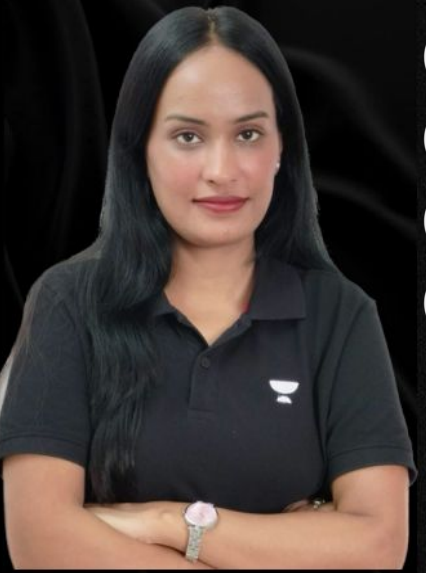
(c) −1049

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 9. The sum of the series 243, 81, 27, ... to 8 terms is

(a) 36

(b) (36 13/30)

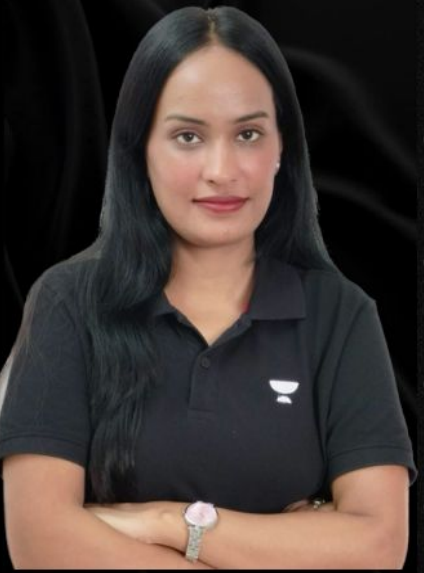
(c) 36 1/9

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 10. The sum of the series $\frac{1}{\sqrt{3}}+1+\frac{3}{\sqrt{3}}+\ldots\ldots$ to 18 terms is

(a) $9841\ \frac{(1+\sqrt{3})}{\sqrt{3}}$

(b) 9841

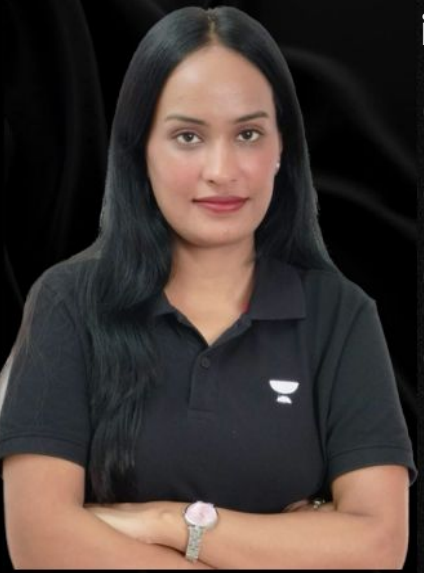
(c) $\frac{9841}{\sqrt{3}}$

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 11. The second term of a G P is 24 and the fifth term is 81. The series is

(a) 16, 36, 24, 54,

(b) 24, 36, 53,...

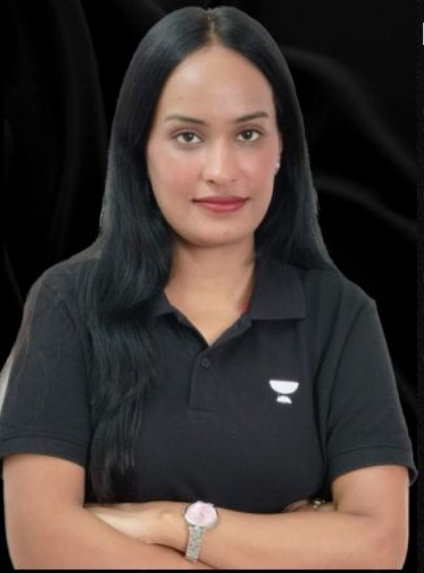
(c) 16, 24, 36, 54,

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 12. The sum of 3 numbers of a G P is 39 and their product is 729. The numbers are

(a) 3, 27,9

(b) 9, 3, 27

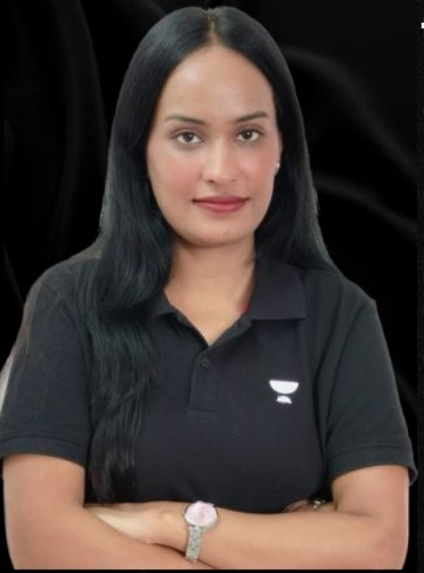
(c) 3, 9, 27

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 13. In a G. P, the product of the first three terms is 27/8. The middle term is

(a) 3/2

(b) 2/3

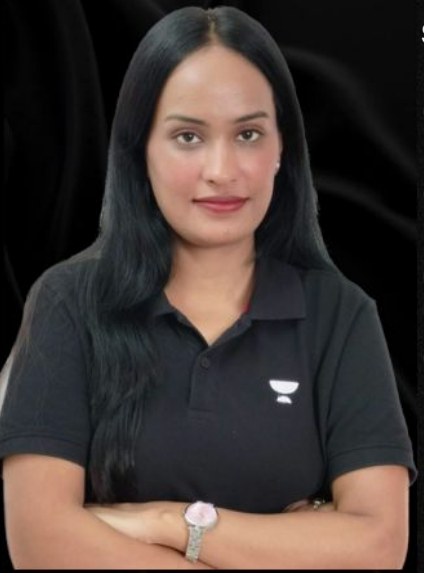
(c) 2/5

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 14. If you save 1 paise today, 2 paise the next day 4 paise the succeeding day and so on, then your total savings in two weeks will be

(a) ₹ 163

(b) ₹ 183

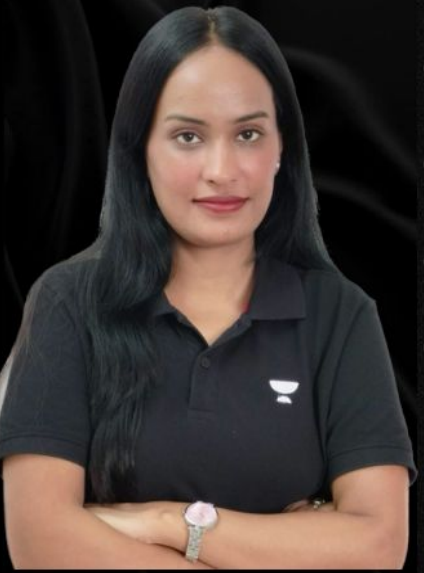
(c) ₹ 163.83

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 15. Sum of n terms of the series 4 + 44 + 444 + ... is

(a) $4/9 \{10/9 (10^n - 1) - n\}$

(b) $10/9 (10^n - 1) - n$

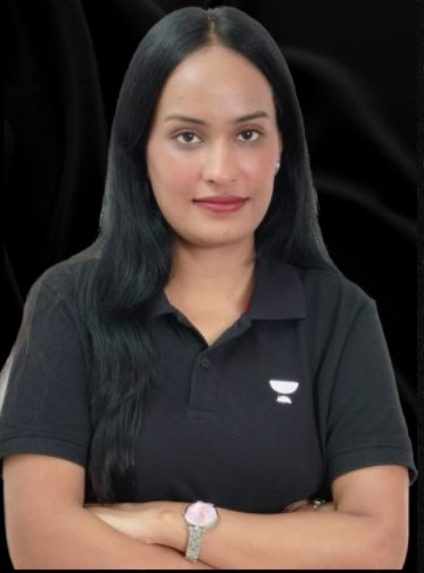
(c) $4/9 (10^n - 1) - n$

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 16. Sum of n terms of the series 0.1 + 0.11 + 0.111 + ... is

(a) $1/9\ (n- (1- (0.1)^n)\}$

(b) $1/9\ \{n - (1-(0.1)^n/9\}$

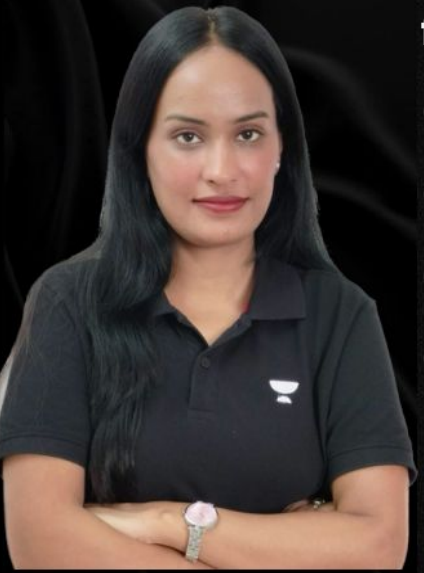
(c) $n - 1 - (0.1)^n/9$

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 17. The sum of the first 20 terms of a G. P is 244 times the sum of its first 10 terms. The common ratio is

(a) $\pm\sqrt{3}$

(b) ± 3

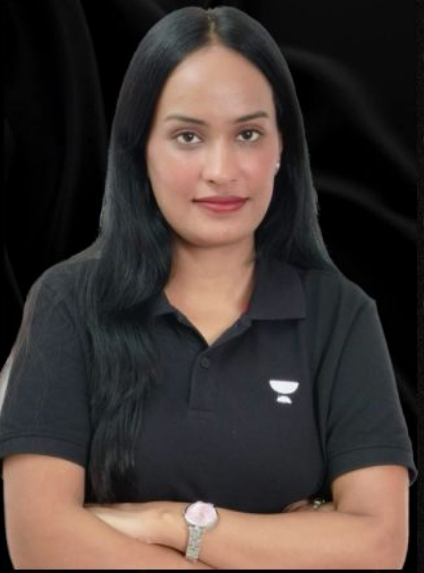
(c) $\sqrt{3}$

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 18. Sum of the series 1 + 3 + 9 + 27 +....is 364. The number of terms is

(a) 5

(b) 6

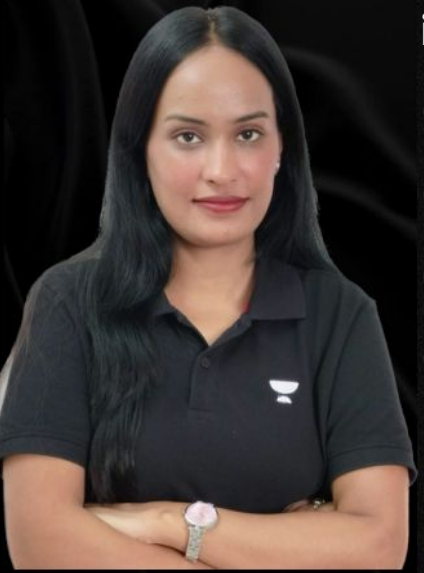
(c) 11

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 19. The product of 3 numbers in G P is 729 and the sum of squares is 819. The numbers are

(a) 9, 3, 27

(b) 27,3,9

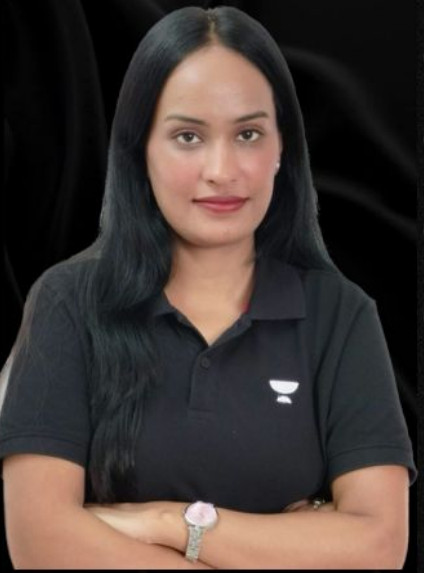
(c) 3, 9, 27

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 20. The sum of the series 1 + 2 + 4 + 8 + .. to n term

(a) $2^n - 1$

(b) 2n – 1

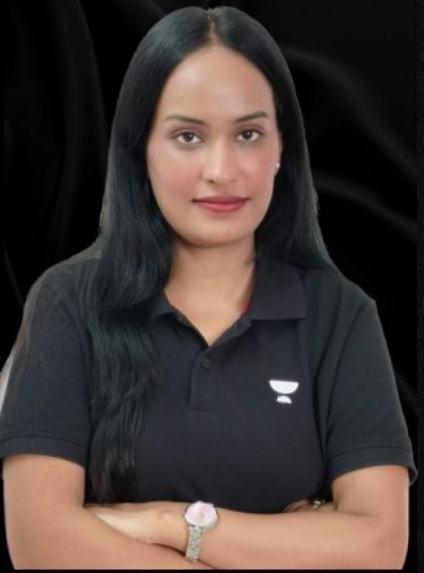
(c) $1/2^n - 1$

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 21. The sum of the infinite GP 14, – 2, + 2/7, – 2/49, + ... is

(a) 4 1/12

(b) 12 1/4

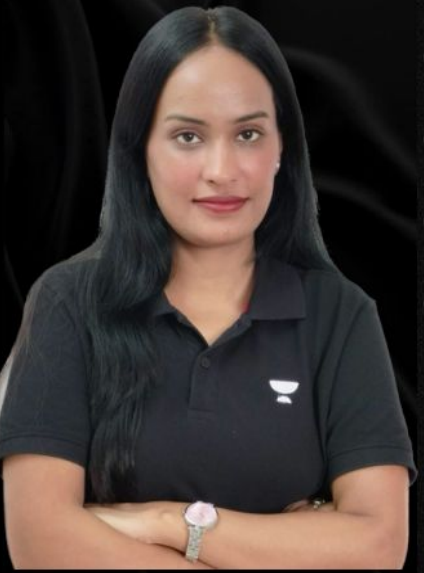
(c) 12

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que22. The sum of the infinite G. P. 1 – 1/3 + 1/9 – 1/27 +... is

(a) 0.33

(b) 0.57

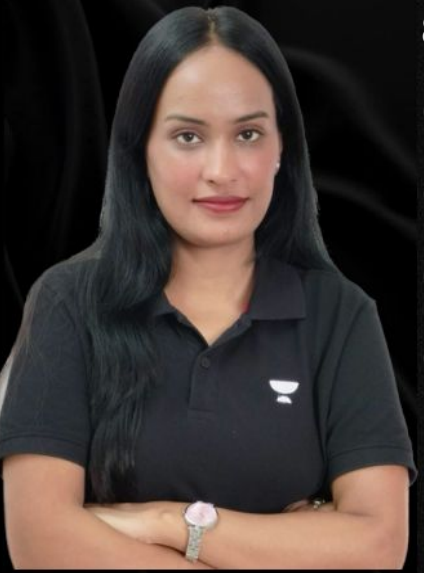
(c) 0.75

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 23. The number of terms to be taken so that 1 + 2 + 4 + 8 + will be 8191 is

(a) 10

(b) 13

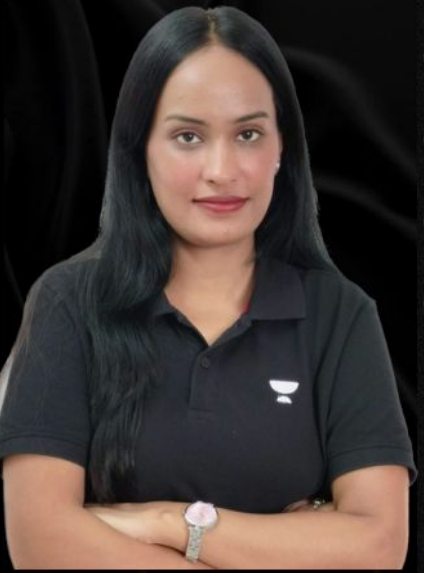
(c) 12

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 24. Four geometric means between 4 and 972 are

(a) 12, 36, 108, 324

(b) 12, 24, 108, 320

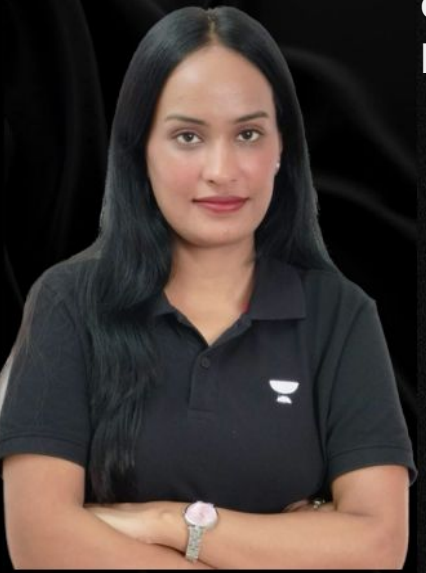
(c) 10, 36, 108, 320

(d) none of these

MATHS

CA FOUNDATION

CODE : SS12



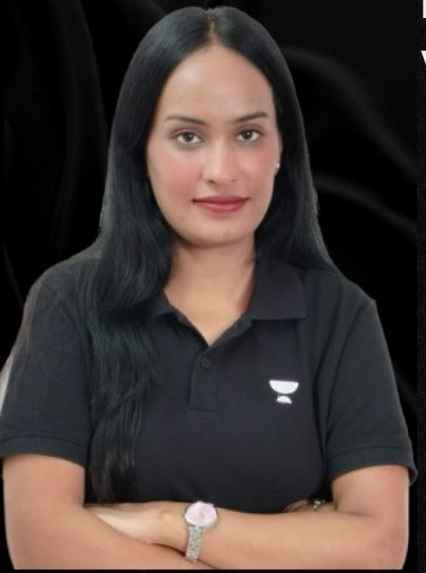
Shivani
Sharma

ILLUSTRATIONS: A person is employed in a company at ₹ 3000 per month and he would get an increase of ₹ 100 per year. Find the total amount which he receives in 25 years and the monthly salary in the last year.

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

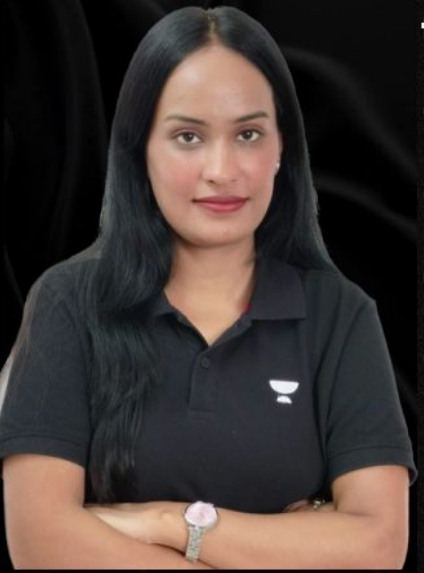
ILLUSTRATIONS: A person borrows ₹ 8,000 at 2.76% Simple Interest per annum. The principal and the interest are to be paid in the 10 monthly instalments. If each instalment is double the preceding one, find the value of the first and the last instalment.

MATHS

EXERCISE 6 (C)

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 1. Three numbers are in AP and their sum is 21. If 1, 5, 15 are added to them respectively, they form a G. P. The numbers are

(a) 5, 7, 9

(b) 9, 5, 7

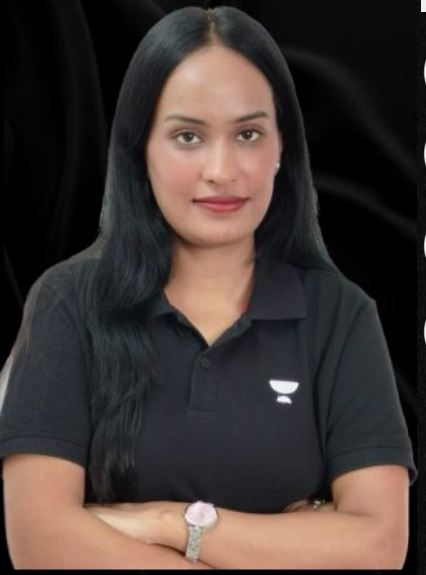
(c) 7, 5, 9

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 2. The sum of $1 + 1/3 + 1/3^2 + 1/3^3 + \ldots + 1/3^{n-1}$ is

(a) 2/3

(b) 3/2

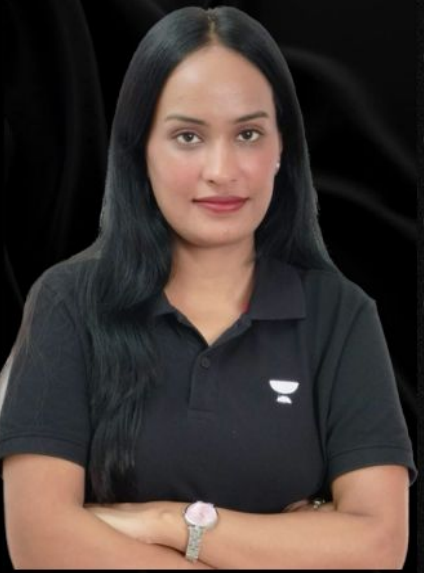
(c) ¾

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 3. The sum of the infinite series 1 + 2/3 + 4/9 + .. is

(a) 1/3

(b) 3

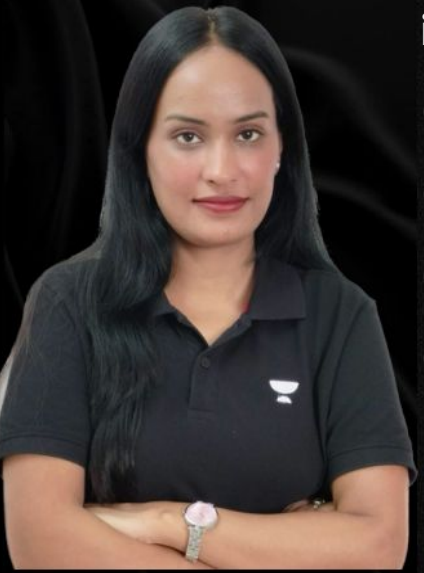
(c) 2/3

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 4. The sum of the first two terms of a G.P. is 5/3 and the sum to infinity of the series is 3. The common ratio is

(a) 1/3

(b) 2/3

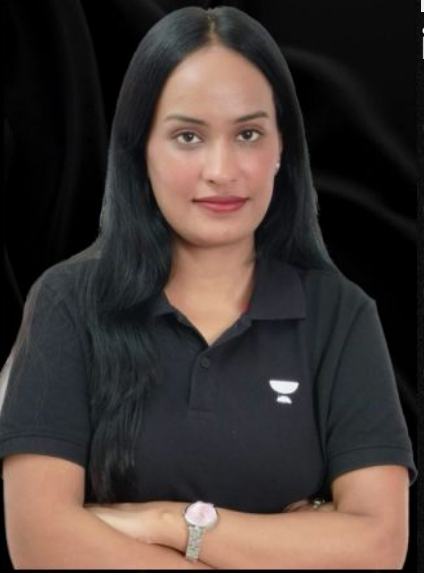
(c) – 2/3

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 5. If p, q and r are in A.P. and x, y, z are in G.P. then $x^{q-r} \cdot y^{r-p} \cdot z^{p-q}$ is equal to

(a) 0

(b) –1

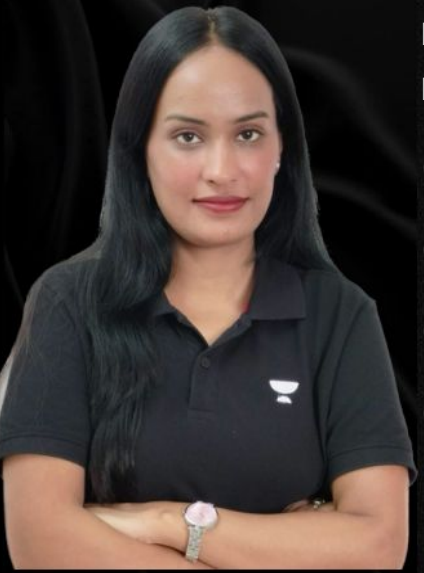
(c) 1

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 6. The sum of three numbers in G.P. is 70. If the two extremes by multiplied each by 4 and the mean by 5, the products are in AP. The numbers are

(a) 12, 18, 40

(b) 10, 20, 40

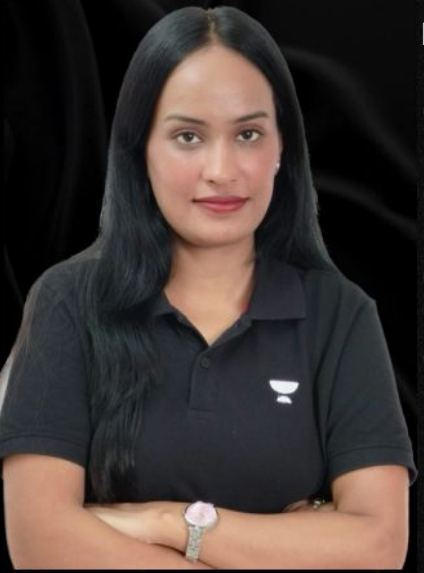
(c) 40, 20, 10

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 7. The sum of 3 numbers in A.P. is 15. If 1, 4 and 19 be added to them respectively, the results are is G. P. The numbers are

(a) 26, 5, –16

(b) 2, 5, 8

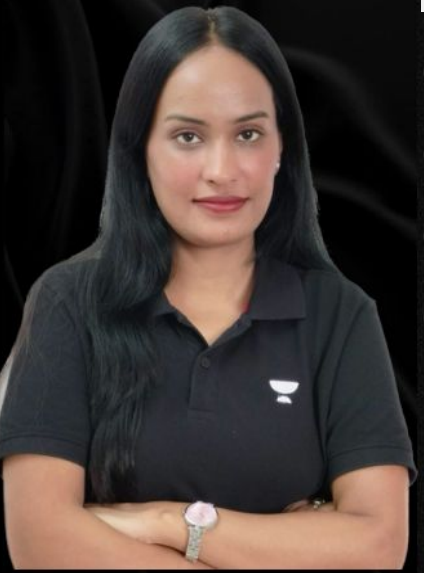
(c) 5, 8, 2

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 8. Given x, y, z are in G.P. and $x^p = y^q = z^\sigma$, then 1/p , 1/q, 1/σ are in

(a) A.P.

(b) G.P.

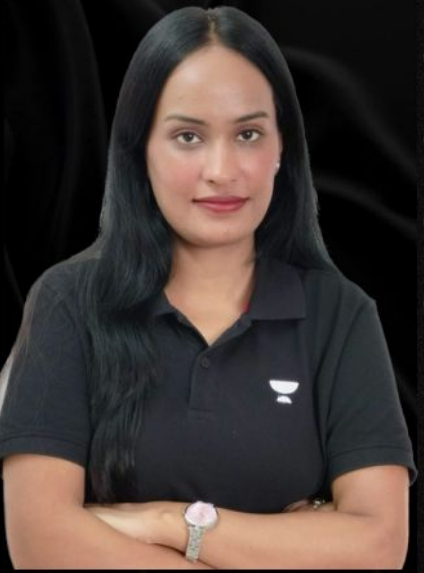
(c) Both A.P. and G.P.

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 9. If the terms 2x, (x + 10) and (3x + 2) be in A.P., the value of x is

(a) 7

(b) 10

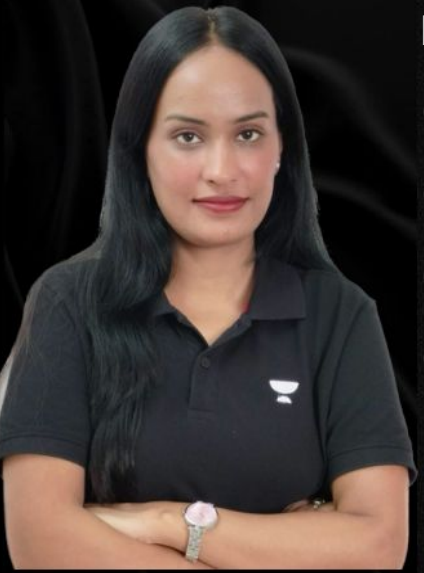
(c) 6

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 10. If A be the A.M. of two positive unequal quantities x and y and G be their G. M, then

(a) $A < G$

(b) $A > G$

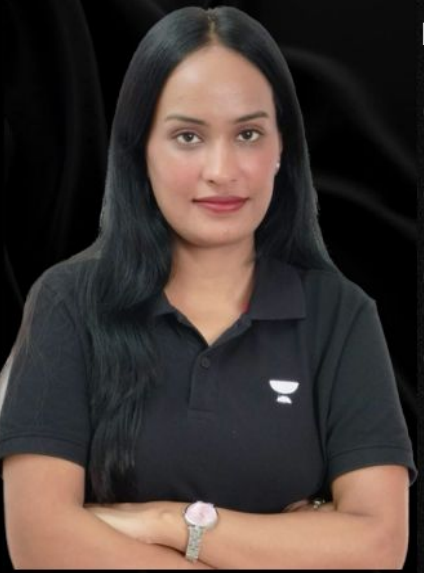
(c) $A \geq G$

(d) $A \leq G$

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 11. The A.M. of two positive numbers is 40 and their G. M. is 24. The numbers are

(a) (72, 8)

(b) (70, 10)

(c) (60, 20)

(d) None of these

MATHS

CA FOUNDATION

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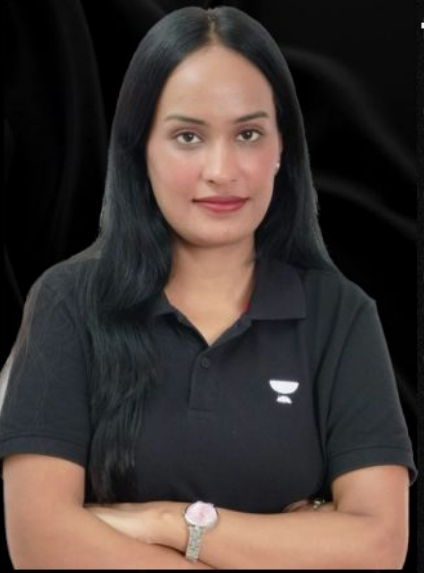


Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 12. Three numbers are in A.P. and their sum is 15. If 8, 6, 4 be added to them respectively, the numbers are in G.P. The numbers are

(a) 2, 6, 7

(b) 4, 6, 5

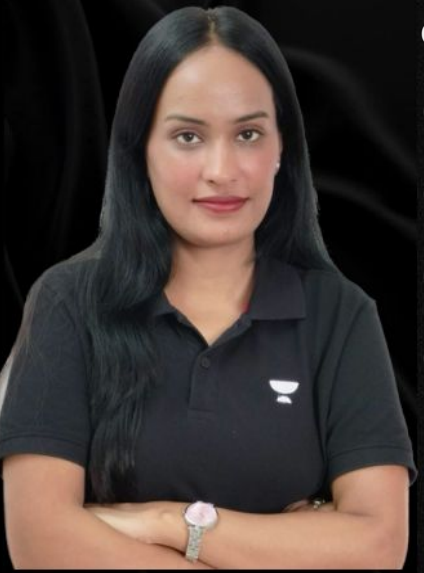
(c) 3, 5, 7

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 13. The sum of four numbers in G. P. is 60 and the A.M. of the first and the last is 18. The numbers are

(a) 4, 8, 16, 32

(b) 4, 16, 8, 32

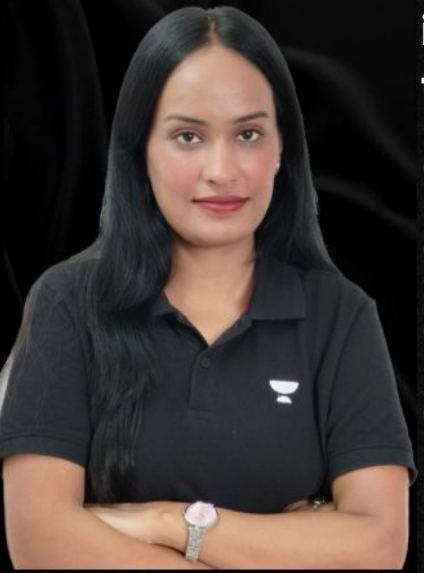
(c) 16, 8, 4, 20

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 14. A sum of ₹ 6240 is paid off in 30 instalments such that each instalment is ₹ 10 more than the preceeding installment. The value of the 1 instalment is st

(a) ₹ 36

(b) ₹ 30

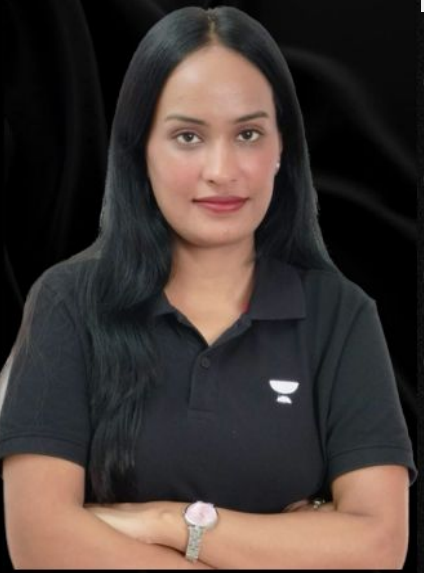
(c) ₹ 60

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 15. The sum of $1.03 + (1.03)^2 + (1.03)^3 + \ldots$ to n terms is

(a) $103\{(1.03)^n - 1\}$

(b) $103/3\{(1.03)^n - 1\}$

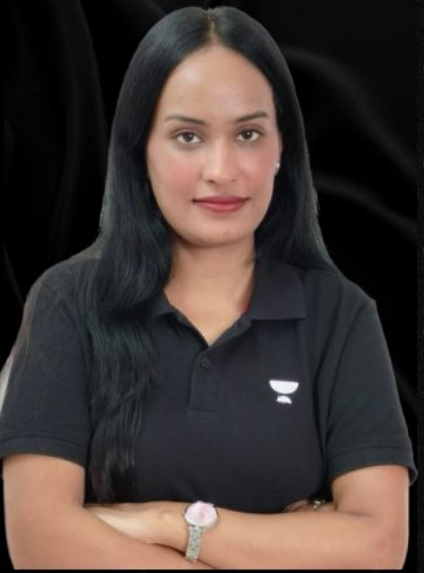
(c) $(1.03)^n - 1$

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 16. If x, y, z are in A.P. and x, y, (z + 1) are in G.P. then

(a) $(x - z)^2 = 4x$

(b) $z^2 = (x - y)$

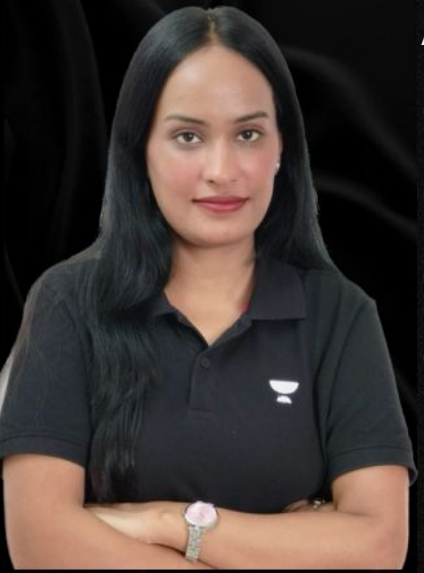
(c) $z = x - y$

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 17. The numbers x, 8, y are in G.P. and the numbers x, y, –8 are in A.P. The value of x and y are

(a) (–8, –8)

(b) (16, 4)

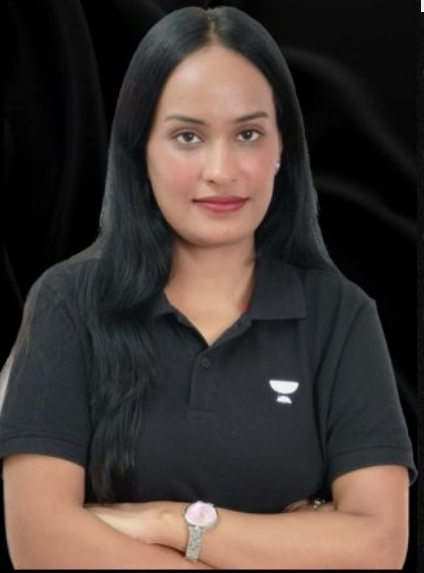
(c) (8, 8)

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 18. The n^{th} term of the series 16, 8, 4,.... in $1/2^{17}$. The value of n is

(a) 20

(b) 21

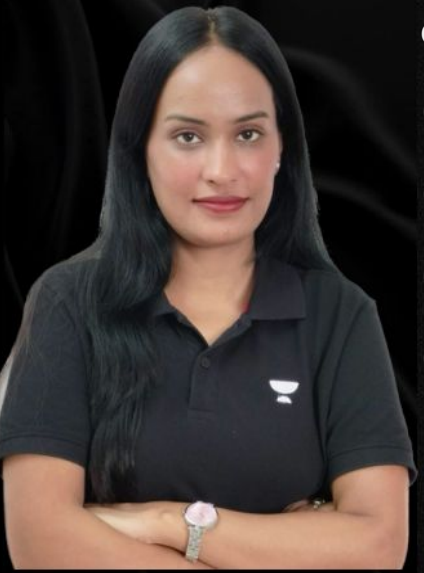
(c) 22

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 19. The sum of n terms of a G.P. whose first terms 1 and the common ratio is 1/2 , is equal to 1 127/128. The value of n is

(a) 7

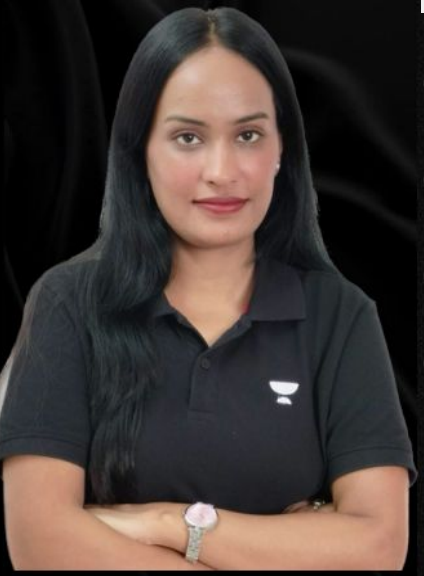
(b) 8

(c) 6

(d) None of these

MATHS

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 20. t_4 of a G.P. in x, t_{10} = y and t_{16} = z. Then

(a) $x^2 = yz$

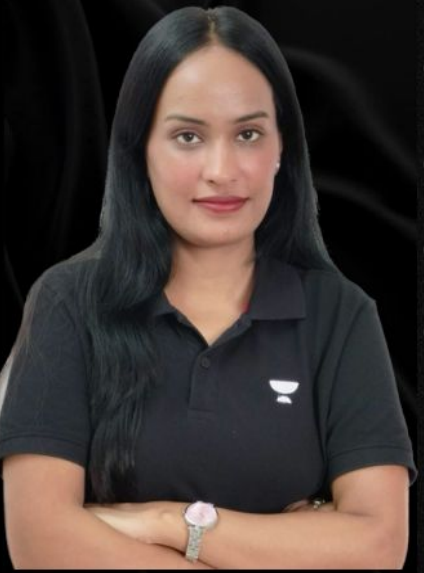
(b) $z^2 = xy$

(c) $y^2 = zx$

(d) None of these

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 21. If x, y, z are in G.P., then

(a) $y^2 = xz$

(b) $y(z^2 + x2) = x(z^2 + y^2)$

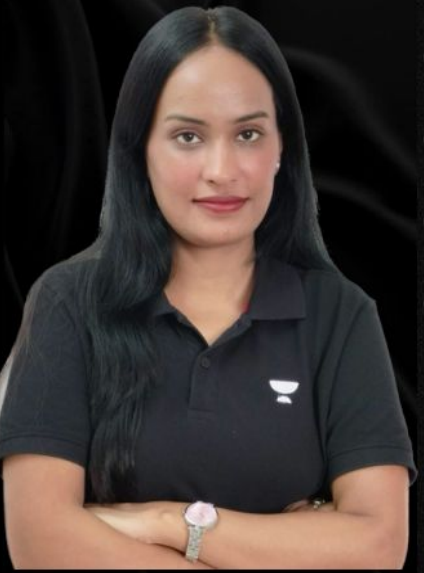
(c) $2y = x + z$

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 22. The sum of all odd numbers between 200 and 300 is

(a) 11,600

(b) 12,490

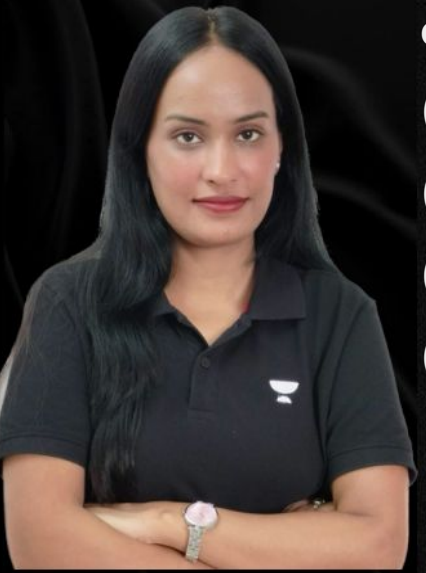
(c) 12,500

(d) 24,750

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 23. The sum of all natural numbers between 500 and 1000 which are divisible by 13, is

(a) 28,405

(b) 24,805

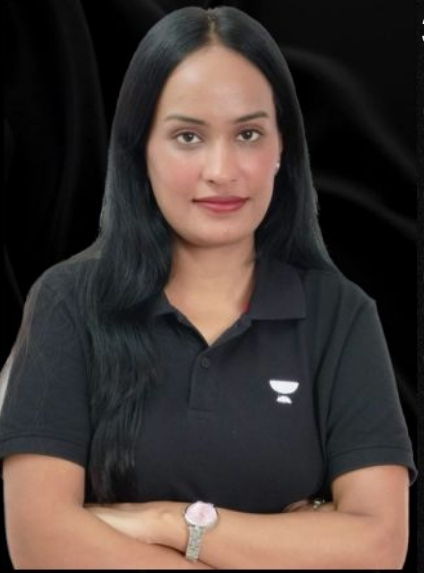
(c) 28,540

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 24. If unity is added to the sum of any number of terms of the A.P. 3, 5, 7, 9,..... the resulting sum is

(a) 'a' perfect cube

(b) 'a' perfect square

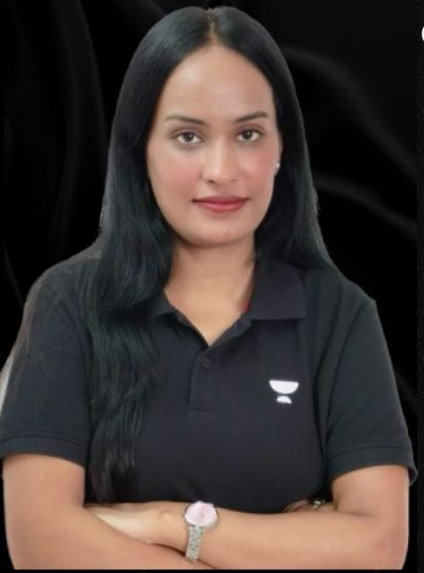
(c) 'a' number

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 25. The sum of all natural numbers from 100 to 300 which are exactly divisible by 4 or 5 is

(a) 10,200

(b) 15,200

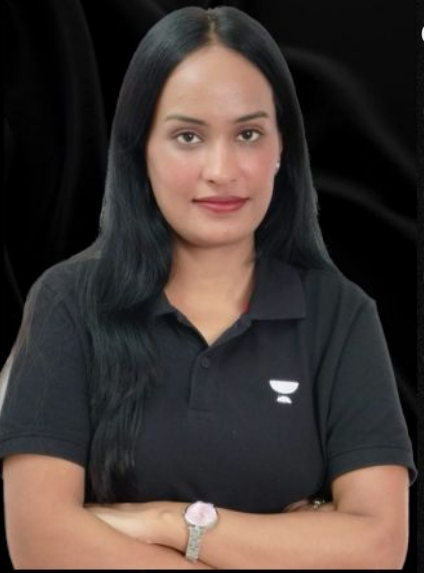
(c) 16,200

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 26. The sum of all natural numbers from 100 to 300 which are exactly divisible by 4 and 5 is

(a) 2,200

(b) 2,000

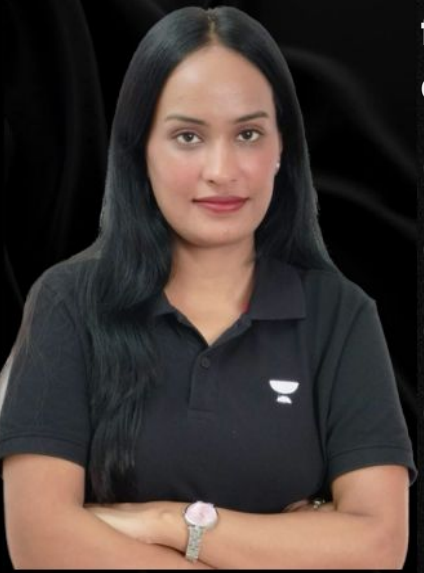
(c) 2,220

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 27. A person pays ₹ 975 by monthly instalment each less then the former by ₹ 5. The first instalment is ₹ 100. The time by which the entire amount will be paid is

(a) 10 months

(b) 15 months

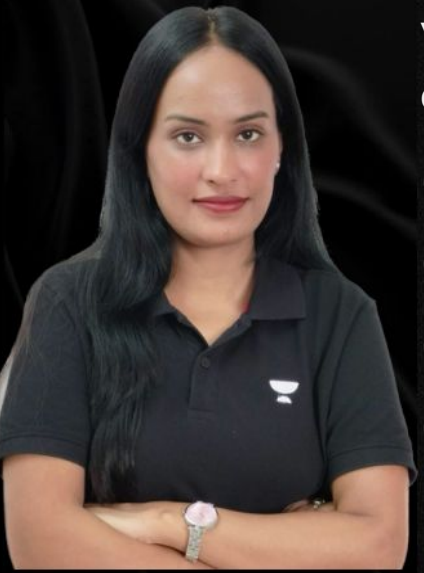
(c) 14 months

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que28. A person saved ₹ 16,500 in ten years. In each year after the first year he saved ₹ 100 more than he did in the preceding year. The amount of money he saved in the 1^{st} year was

(a) ₹ 1000

(b) ₹ 1500

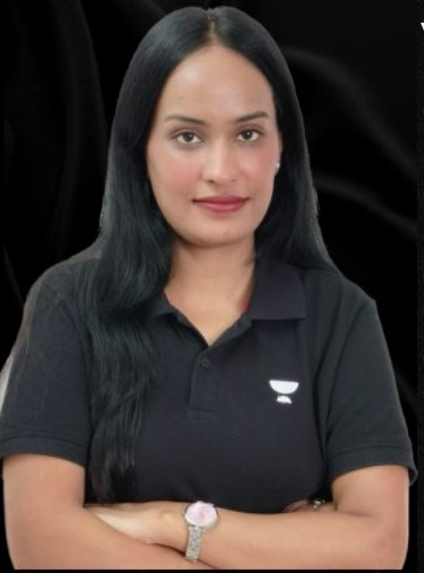
(c) ₹ 1200

(d) None of these

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 29. At 10% C.I. p.a., a sum of money accumulate to ₹ 9625 in 5 years. The sum invested initially is

(a) ₹ 5976.37

(b) ₹ 5970

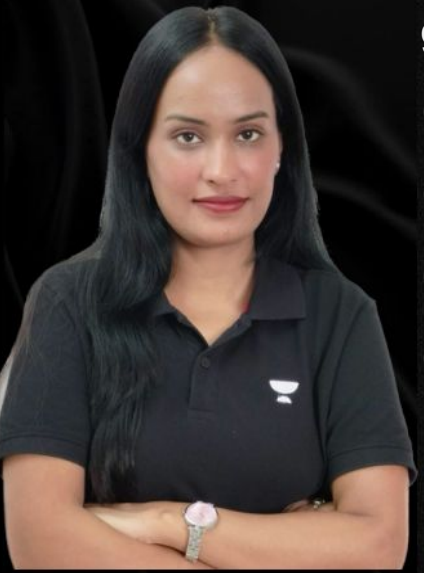
(c) ₹ 5975

(d) ₹ 5370.96

MATHS

CA FOUNDATION

CODE : SS12



Shivani
Sharma

Choose the most appropriate option (a), (b), (c) or (d)

Que 30. The population of a country was 55 crores in 2005 and is growing at 2% p.a C.I. the population is the year 2015 is estimated as

(a) 5705

(b) 6005

(c) 6700

(d) None of these

MATHS