1. SEQUENCE

Let's list the square of natural numbers.

$\mathbb{N}$	Square
1	1
2	4
3	9
4	16
n	n^2

Observe that we got a function $f:\mathbb{N}\to\mathbb{R}$.

We can show in the following manner also.

$f(1)=1$		$f_1=1$
$f(2)=4$		$f_2=4$
$f(3)=9$	or	$f_3=9$
$f(4)=16$		$f_4=16$
$f(n)=n^2$		$f_n=n^2$

We can also write in list format.

$f_n=(1,4,9,16,\ldots,n^2,\ldots)\to$ sequence f_n

$f_n=n^2\to$ general term of the sequence

Example: Write the first 6 terms of the sequence given by the general term of $a_n=\dfrac{1}{n}$.

Example: Given the sequence with general term of $b_n=\dfrac{2n-3}{3n}$, find

- $b_4=$
- $b_{-3}=$
- $b_{20}=$

Example: Find the general term of the sequence $c_n=(2,4,6,8,\ldots)$.

Example: Find the general term of the sequence $d_n=(1,3,5,7,\ldots)$.

Example: Find the general term of the sequence below.

$$a_n=(\frac{1}{2},\frac{1}{6},\frac{1}{12},\frac{1}{20},\frac{1}{30},\frac{1}{42},\ldots)$$

2. SUM NOTATION ($\sum$)

Let's take a sequence $f_n=(f_1,f_2,f_3,f_4,\ldots,f_n)$.

Sum of all terms of f_n can be represented by $\sum$. That is,

Sum Notation

$$f_1+f_2+f_3+f_4+\ldots+f_n=\sum_{k=1}^{n}f_k$$

where $k,n\in\mathbb{N}$, k is a sum index.

Example: Calculate the following terms.

- $\sum_{k=1}^{4}a_k=$
- If $a_n=(3,6,-4,8,11,15)$, then $\sum_{k=1}^{3}a_k=$
- If $a_n=2n+3$, then $\sum_{k=3}^{6}a_k=$
- $\sum_{k=1}^{6}3=$
- $\sum_{i=4}^{7}i^2=$
- $\sum_{m=1}^{5}7m=$
- $\sum_{t=4}^{9}\left(t^2-3t\right)=$
- $\sum_{m=3}^{5}\left(2^{m-2}\right)=$
- $\sum_{n=1}^{7}\left(\dfrac{n-1}{n^2+1}\right)=$

Note: Sum notation index can be extended to negative integers also.

Example: Calculate the following terms.

- $\sum_{k=-3}^{9}k=$
- $\sum_{k=-10}^{-2}4=$

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Mathematical Induction

Let $S(n)$ be any statement about a natural number n.
If
1. $S(1)$ is true.
2. $S(k)$ implies $S(k+1)$

Then, $S(n)$ is true for all natural number n.

Example: Prove that the sum of the first n positive integers is equal to $\frac{n\cdot(n+1)}{2}$. (That is, $1+2+3+\ldots+n=\frac{n\cdot(n+1)}{2}$)

Example: Prove that $1+3+5+7+\ldots+(2n-1)=n^2$.

Example: Prove that

$$1\cdot 2+2\cdot 3+3\cdot 4+\ldots+n\cdot(n+1)=\frac{n\cdot(n+1)\cdot(n+2)}{3}.$$

Example: Prove that $\frac{1}{1\cdot 2}+\frac{1}{2\cdot 3}+\frac{1}{3\cdot 4}+\ldots+\frac{1}{n\cdot(n+1)}=\frac{n}{n+1}$.

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Some Important Formulas

1. $1+2+3+\ldots+n=\sum_{k=1}^{n}k=\frac{n(n+1)}{2}$
2. $2+4+6+\ldots+(2n)=\sum_{k=1}^{n}(2k)=n(n+1)$
3. $1+3+5+7+\ldots+(2n-1)=\sum_{k=1}^{n}(2k-1)=n^2$
4. $1^2+2^2+3^2+\ldots+n^2=\sum_{k=1}^{n}k^2=\frac{n(n+1)(2n+1)}{6}$
5. $1^3+2^3+3^3+\ldots+n^3=\sum_{k=1}^{n}k^3=\left[\frac{n\cdot(n+1)}{2}\right]^2$
6. $1\cdot 2+2\cdot 3+3\cdot 4+\ldots+n\cdot(n+1)$
   $=\sum_{k=1}^{n}k(k+1)=\frac{n(n+1)(n+2)}{3}$
7. $\frac{1}{1\cdot 2}+\frac{1}{2\cdot 3}+\frac{1}{3\cdot 4}+\ldots+\frac{1}{n\cdot(n+1)}=\sum_{n=1}^{k}\frac{1}{k(k+1)}=\frac{n}{n+1}$

Example: Calculate the following terms.

- $\sum_{k=1}^{18}k=$
- $\sum_{k=1}^{11}2k-1=$
- $\sum_{m=1}^{16}2m=$
- $\sum_{p=1}^{6}p^2=$
- $\sum_{j=1}^{10}\frac{1}{j(j+1)}=$

Properties of Sum Notation

$c\in\mathbb{R}$, $p,r,n\in\mathbb{N}$

1. $\sum_{k=1}^{n}(c\cdot a_k)=c\cdot\sum_{k=1}^{n}a_k$
2. $\sum_{k=1}^{n}(a_k\pm b_k)=\sum_{k=1}^{n}a_k\pm\sum_{k=1}^{n}b_k$
3. $\sum_{k=1}^{n}a_k=\sum_{k=1}^{p}a_k+\sum_{k=p+1}^{n}a_k$ where $p<n$
4. $\sum_{k=p}^{n}a_k=\sum_{k=p-r}^{n-r}a_{k+r}=\sum_{k=p+r}^{n+r}a_{k-r}$

Example: Calculate the following terms.

- $\sum_{k=1}^{4}(2k)=$

- $\sum_{k=1}^{6}\left(a\cdot k^{2}\right)=$
- (UN 2004)
  $\sum_{n=1}^{8}(2n+3)=$
- $\sum_{k=1}^{8}\left(k^{2}-k\right)=$
- $\sum_{k=9}^{14}k^{2}=$
- $\sum_{k=4}^{14}k(k+1)=$
- $\sum_{k=-6}^{4}k^{3}=$
- $\sum_{k=4}^{10}\frac{6}{(k+2)(k+3)}=$

3. MULTIPLICATION NOTATION ($\prod$)

Let's take a sequence $a_n=(a_1,a_2,a_3,a_4,\ldots,a_n)$

Multiplication of all terms of a_n can be represented by $\prod$ .That is,

Multiplication Notation

$$a_1\cdot a_2\cdot a_3\cdot a_4\cdot\ldots\cdot a_n=\prod_{k=1}^{n}a_k$$

Note: Multiplication notation index can be also extended to negative integers.

Example: Calculate the following terms.

- $\prod_{k=1}^{5}k=$
- $\prod_{m=1}^{6}2m=$
- $\prod_{m=1}^{9}7=$
- $\prod_{k=1}^{4}3m=$
- $\prod_{k=-10}^{24}(k+3)=$

Properties of Multiplication Notation

$c\in\mathbb{R}$

1. $\prod_{k=1}^{n}c=c^{n}$
2. $\prod_{k=1}^{n}k=n!$
3. $\prod_{k=1}^{n}(c\cdot a_k)=c^{n}\cdot\prod_{k=1}^{n}a_k$
4. $\prod_{k=1}^{n}(a_k\cdot b_k)=\prod_{k=1}^{n}a_k\cdot\prod_{k=1}^{n}b_k$

Example: Calculate the following terms.

- $\prod_{k=1}^{10}2=$
- $\prod_{k=-4}^{5}\frac{1}{3}=$
- $\prod_{k=1}^{15}k=$
- $\prod_{k=-2}^{100}k=$
- $\prod_{k=1}^{8}5k=$
- $\prod_{k=1}^{7}\left(k\cdot 5^{k}\right)=$

Example: Calculate the followings

- $\prod_{k=1}^{20}\left(1+\frac{1}{k}\right)=$
- $\prod_{k=3}^{80}\log_k(k+1)=$
- $\prod_{k=10}^{20}\frac{k+1}{k+3}=$
- $\sum_{k=-2}^{4}\prod_{m=1}^{2}(m-k-1)=$
- $\prod_{m=0}^{4}\prod_{n=1}^{3}\left(2^{m+n}\right)=$

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Example: Prove that $\prod_{k=1}^{n}(2k-1)=\frac{(2n)!}{2^n \cdot n!}$

4. ARITHMETIC SEQUENCES and SERIES

If a sequence a_n has the same difference d between its consecutive terms, then it is called an **arithmetic sequence**.

Arithmetic Sequence

a_n is arithmetic sequence iff $a_{n+1}-a_n=d$ for each n.

$a_{n+1}-a_n=d$ is called a **common difference**

Example: $a_n=(6,11,16,21,26,\ldots)$ $a_{n+1}-a_n=5 \Rightarrow$ arithmetic

Example: State whether the following sequences are arithmetic or not. If so, find the common difference.

- $a_n=(7,11,15,17,\ldots)$
- $b_n=(-1,-7,-13,-19,\ldots)$
- $c_n=(5,5,5,5,\ldots)$
- $d_n=(1,4,9,16,\ldots)$
- $a_n=3n+5$
- $b_n=(n-1)(n+2)$
- $c_n=\frac{n^2+5n+6}{n+3}$

General Term Formula

General term of an arithmetic sequence a_n with the common difference d is

$$a_n=a_1+(n-1)d$$

Example: $a_n=(-2,5,12,\ldots)$ is an arithmetic sequence. Find the 18th term.

Example: a_n is an arithmetic sequence with $a_1=3$ and $a_7=27$. Find the common difference and a_{105}.

Example: a_n is an arithmetic sequence with $a_1=24$ and common difference -3. Is -24 a term of this sequence?

Example: (UN 2009 PAKET A/B)
Barisan bilangan aritmetika terdiri dari 21 suku. Suku tengah adalah 52, sedangkan $u_3+u_5+u_{15}=106$. Suku ke-7 barisan tersebut adalah …
An arithmetic sequence consists of 21 elements. Middle term is 52 and $u_3+u_5+u_{15}=106$. The 7th term is …

Example: (UN 2010 PAKET A/B)
Diketahui barisan aritmetika dengan u_n adalah suku ke-n. Jika $u_2+u_{15}+u_{40}=165$, maka $u_{19}=\ldots$
u_n represents the nth term of an arithmetic sequence. If $u_2+u_{15}+u_{40}=165$, then $u_{19}=\ldots$

Example: Find the number of terms in the arithmetic sequence $(1,5,9,13,\ldots,125)$.

Number of Terms of a Finite Arithmetic Sequence

The number of terms in a finite arithmetic sequence is

$$n=\frac{a_n-a_1}{d}+1$$

Observe that this is obtained from the General Term Formula

Advanced General Term Formula

General term of an arithmetic sequence a_n with the common difference d is

$$a_n=a_p+(n-p)d$$

where a_p is any term of the sequence

Example: a_n is an arithmetic sequence with $a_7=37$ and $a_{24}=3$. Find the common difference.

Example: a_n is an arithmetic sequence with $a_{12}-a_6=28$. Find $a_{24}-a_{11}$.

Example: (UN 2011 PAKET 46)
Suku ke-6 dan ke-12 suatu barisan aritmetika berurut-turut adalah 35 dan 65. Suku ke-52 barisan aritmetika tersebut adalah …
The 6th and 12th terms of one of the arithmetic sequence are 35 and 65 respectively. The 52nd term is …

Example: Given an arithmetic sequence a_n with $a_{10} = 22$, find $a_4 + a_{16}$.

Middle Term Formula (Arithmetic Mean)

In an arithmetic sequence, $a_p = \dfrac{a_{p-k} + a_{p+k}}{2}$ where $k < p$.

Example: $7, x, 17$ are three consecutive terms of an arithmetic sequence. Find x.

Example: Find the general term a_n for the arithmetic sequence with $a_5 + a_{13} = 12$ and $a_{23} = 96$.

Sum of the First n terms of an Arithmetic Sequence (S_n)

$$S_n = \frac{a_1 + a_n}{2} \cdot n$$

Example: Given an arithmetic sequence with $a_1 = 3$ and $a_7 = 15$, find S_6.

Example: Given an arithmetic sequence with $a_1 = -6$ and $d = 3$, find S_{18}.

Example: Given an arithmetic sequence with $a_1 = 66$ and $a_{15} = -18$, find S_{20}.

Example: $-12 + \ldots + 88 = 798$ is the sum of the terms of a finite arithmetic sequence, how many terms are there in the sequence?

Alternative Sum Formula (S_n)

$$S_n = \frac{2a_1 + (n-1)d}{2} \cdot n$$

Example: Given an arithmetic sequence with $a_1 = -4$ and $S_{12} = -246$, find d.

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Example: Given an arithmetic sequence with $d = 6$ and $S_{10} = 20$, find a_1.

Example: a_n is an arithmetic sequence with $S_{12} = 30$ and $S_8 = 4$, find a_3.

Example: (UN 2012/C37)
Jumlah n suku pertama deret atirmetika dinyatakan dengan $S_n = 2n^2 + 4n$. Suku ke-9 dari deret aritmetika tersebut adalah...
Sum of the first n terms of an arithmetic sequence is given by $S_n = 2n^2 + 4n$. The 9th term of this sequence is ...

Example: (UN 2008 PAKET A/B)
Suku keenam dan kedua belas suatu deret aritmetika berturut-turut adalah 43 dan 85. Jumlah dua puluh lima suku pertama deret tersebut adalah...
The 6th and 12th terms of an arithmetic sequence are 43 and 85 respectively. Sum of the first 25 terms of this sequence is ...

Example: (UN 2007 PAKET B)
Diketahui suatu barisan aritmetika, u_n menyatakan suku ke-n. Jika $u_7 = 16$ dan $u_3 + u_9 = 24$, maka jumlah 21 suku pertama dari deret aritmetika tersebut adalah ...
Given that u_n represents the nth term of an arithmetic sequence. If $u_7 = 16$ and $u_3 + u_9 = 24$, then sum of the first 21 terms of this arithmetic sequence is ...

Example: A man climbing up a mountain climbs 800 m in the first hour and 25 m less than the previous hour in each subsequent hour. In how many hours can he climb 5700 m?

Example: (UN 2012/B25)
Sebuah pabrik memproduksi barang jenis A pada tahun pertama sebesar 1.960 unit. Tiap tahun produksi turun sebesar 120 unit sampai tahun ke-16. Total seluruh produksi yang dicapapi tahun ke-16 adalah …
One fabric produces A item in an amount of 1.960 in the first year. Production is decreased in an amount of 120 in each coming year until 16th year. The total amount of A production until the 16th year is …

Example: (UN 2011 PAKET 12)
Seorang penjual daging pada bulan Januari menjual 120 kg, bulan Februari 130 kg, Maret dan seterusnya selama 10 bulan selalu bertambah 10 kg dari bulan sebelumnya. Jumlah daging yang terjual selama 10 bulan adalah …
A butcher sold 120 kg meat on January, 130 kg on February, and continued 10 months by adding 10 kg to the amount of previous month. Total amount of meat sold during 10 moths is …

5. GEOMETRIC SEQUENCES and SERIES

If a sequence b_n has the same ratio q between its consecutive terms, then it is called a **geometric sequence**.

Geometric Sequence

b_n is geometric sequence iff $\frac{b_{n+1}}{b_n} = q$ for each n.

$\frac{b_{n+1}}{b_n} = q$ is called a **common ratio.**

Example: $b_n = (1,2,4,8,\ldots)$ $\frac{b_{n+1}}{b_n} = 2 \Rightarrow$ geometric sequence

Example: State whether the following sequences are geometric or not. If so, find the common ratio.

- $a_n = (2,6,18,54,\ldots)$
- $b_n = (-1,-7,-13,-19,\ldots)$
- $c_n = (4,4,4,4,\ldots)$
- $d_n = (1,4,9,16,\ldots)$
- $e_n = \left(25,-5,1,-\frac{1}{5},\ldots\right)$
- $a_n = 2^n$
- $b_n = n^2 - 4$
- $c_n = 5 \cdot 3^{n+5}$
- $d_n = 2n + 6$

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General Term Formula

General term of a geometric sequence b_n with the common ratio q is

$$b_n = b_1 \cdot q^{n-1}$$

Example: $b_n = (81,27,9,\ldots)$ is a geometric sequence. Find the 7th term.

Example: b_n is a geometric sequence with $b_1 = \frac{1}{25}$ and $q = 5$. Find b_4.

Example: b_n is a geometric sequence with $b_1 = \frac{1}{9}$ and $q = -3$. Is 243 a term of this sequence?

Example: In a positive geometric sequence b_n, $b_1 \cdot b_5 = 12$ and $\frac{b_2}{b_4} = 3$. Find b_2.

Example: (UN 2012/D49)
Barisan geometri dengan suku ke-5 adalah $\frac{1}{3}$ dan rasio $= \frac{1}{3}$, maka suku ke-9 barisan geometri tersebut adalah…
A geometric sequence with 5th term as $\frac{1}{3}$ and ratio as $\frac{1}{3}$ is given. The 9th term of this sequence is …

Advanced General Term Formula

General term of a geometric sequence b_n with the common ratio q is

$$b_n = b_p \cdot q^{n-p}$$

where b_p is any term of the sequence.

Example: b_n is a geometric sequence with $b_4 = 56$, $q = -\frac{1}{2}$. Find b_9.

Example: b_n is a geometric sequence with $b_{12} = 4$ and $b_{16} = 64$. Find the common ratio.

Example: (UN 2012/A13)
Barisan geometri dengan $u_7 = 384$ dan rasio $= 2$. Suku ke-10 barisan tersebut adalah…
Given a geometric sequence with $u_7 = 384$ and ratio $= 2$, the 10th term of this sequence is …

Middle Term Formula (Geometric Mean)

In a geometric sequence, $b_p{}^2 = b_{p-k} \cdot b_{p+k}$ where $k < p$.

Example: Given a geometric sequence b_n with $b_6 = 8$. Find $b_3 \cdot b_9$.

Example: $1-x$, $6x$ and $19-2x$ are three consecutive terms of a geometric sequence. Find x.

Example: Find the common ratio q for the geometric sequence b_n with $b_1 = 32$ and $b_2 \cdot b_9 = 2$.

Example: Three numbers form a geometric sequence. If we increase the second number by 2, we get an arithmetic sequence. After this, if we increase the third number by 9, we get a geometric sequence again. Find the three initial numbers.

Example: (UN 2010 PAKET A/B)
Tiga buah bilangan membentuk barisan aritmetika dengan beda tiga. Jika suku kedua dikurangi 1, maka terbentuklah barisan geometri dengan jumlah 14. Rasio barisan tersebut adalah …
Three different numbers form an arithmetic sequence. If we decrease the second number by 1, we get a geometric sequence with sum of the elements as 14. The ratio of the geometric sequence is …

Example: (UN 2009 PAKET A/B)
Tiga bilangan membentuk barisan aritmetika. Jika suku ketiga ditambah dua, dan suku kedua dikurangi dua, diperoleh barisan geometri. Jika suku ketiga barisan aritmetika ditambah 2 maka hasilnya menjadi empat kali suku pertama. Maka suku pertama deret aritmetika tersebut adalah…
Three numbers form an arithmetic sequence. If we increase the third number by 2, and decrease the second number by 2, then we get a geometric sequence. If we increase the third number by 2, the result is equal to four times the first number. The first number of arithmetic sequence is …

Sum of the First n terms of a Geometric Sequence (S_n)

$$S_n = b_1 \cdot \frac{1-q^n}{1-q}, \quad q \neq 1$$

Example: Given a geometric sequence b_n with $b_1 = \frac{1}{128}$ and $q = 2$. Find S_8.

Example: Given a geometric sequence b_n with $S_5 = 1210$ and $q = 3$. Find b_1.

Example: Given a geometric sequence b_n with $b_1 = 4$ and $S_4 = -20$. Find q.

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Example: (UN 2004)
Jumlah lima suku pertama suatu deret geometri adalah 93 dan rasio deret itu 2, hasil kali suku ke-3 dan ke-6 adalah ...
Sum of the first 5 elements of a geometric sequence is 93 and the ratio is 2. Multiplication of 3rd and 6th element of the sequence is ...

Example: (UN 2012/A13)
Suku ke-3 dan suku ke-7 suatu deret geometri berturut-turut 16 dan 256. Jumlah tujuh suku pertama deret tersebut adalah...
The 3rd and 7th terms of a geometric sequence are 16 and 156 respectively. Sum of the first seven terms of the sequence is ...

Example: Given a geometric sequence b_n with $S_7 = 14$ and $S_{14} = 18$. Find $b_{15} + \ldots + b_{21}$.

Example: b_n is a geometric sequence such that the sum of the first three terms is 91, and the terms $b_1 + 25$, $b_2 + 27$, $b_3 + 1$ form an arithmetic sequence. Find b_1.

Example: In each year, population of a certain type of insect increases 3 times the previous year population. If the current population is 5.000, find the total population at the end of the 10th year.

Infinite Sum of a Geometric Sequence (S)

$$S = \frac{b_1}{1-q}, \; |q| < 1$$

Example: Find the infinite sum of $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \ldots$

Example: Find the infinite sum of $200 + 20 + 2 + \frac{1}{5} + \ldots$

Example: Find the infinite sum of $6 - 18 + 54 - 162 + \ldots$

Example: (UN 2007 PAKET B)
Sebuah bola pingpong dijatuhkan ke lantai dari ketinggian 2 meter. Setiap bola itu memantul is mencapai ketinggian $3/4$ dari ketinggian yang dicapai sebelumnya. Panjang lintasan bola tersebut hingga bola berhenti adalah ... meter
A ping pong ball is dropped from a height of 2 m. Each time it bounces, it returns to $3/4$ of its previous height. The total distance the ball has travelled in the air until it stops is ... m

Example: (UN 2009 PAKET A/B)
Sebuah ayunan mencapai lintasan pertama sejauh 90 cm, dan lintasan berikutnya hanya mencapapi $\frac{5}{8}$ dari lintasan sebelumnya. Panjang lintasan seluruhnya hingga ayunan berhenti adalah ... cm
A swing covers the 90 cm trajectory at the beginning, then next trajectory is $\frac{5}{8}$ of the previous one. Total trajectory covered until the swing stops is ... cm

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Review Test

1. $\sum_{k=1}^{61}(-1)^k(2k+5)=?$

A)-67 B)-68 C)-128 D)68 E)112

2. If $\sum_{1}^{6} a_i = 15$, then find the value of $\sum_{1}^{6}(2a_i+3)$.

A) 42 B) 44 C) 46 D) 48 E) 50

3. $\prod_{p=1}^{10}\left(\frac{1}{2}\right)^{p-1} = 2^n \Rightarrow n=?$

A) 55 B) 45 C) -35 D) -45 E) –55

4. $\prod_{k=1}^{20}\left(1-\frac{1}{k+3}\right)=?$

A) $\frac{20}{3}$ B) $\frac{3}{22}$ C) $\frac{3}{23}$ D) $\frac{4}{21}$ E) $\frac{2}{25}$

5. The n-th term of an arithmetic sequence is given by the formula $u_n = 7+11n$. Common difference of the sequence is.....

A) 7 B) 11 C) 18 D) 4 E) -4

6. Given an arithmetic sequence of 1, 6, 11, 16 ....
Between each two terms, 4 terms are inserted so that a new arithmetic sequence is formed. The common difference of the new sequence is.....

A) 1 B) 2 C) 3 D) 4 E) 5

7. In an arithmetic sequence the 20th term and the 25th term are 45 and 47 respectively. Find the 36th term of the sequence?

A) $\frac{257}{5}$ B) $\frac{3}{7}$ C) $\frac{4}{9}$ D) 5 E) 6

8. Given that $u_8 = 46$ and $u_5 = 31$, the 10th term of this arithmetic sequence is......

A) 52 B) 54 C) 56 D) 58 E) 60

9. Given the following sequence:
2, 5, 10, 17, 26, 37 ....

The 100th term of that sequence is.....

A) 8.004 B) 8.007 C) 9.003 D) 9.999 E) 10.001

10. Given an arithmetic sequence that $S_n = n^2+5n$. The common difference of that sequence is...

A) 6 B) 7 C) 8 D) 9 E) 10

11. In a geometric sequence, if the first term is $\frac{1}{9}$ and common ratio is 3, then find the eight term of the sequence.

A) 243 B) 81 C) 27 D) 9 E) 3

12. Three consecutive positive numbers form a geometric sequence of ratio 5. If the second term is added by 16, then an arithmetic sequence is formed of common difference....

A) 16 B) 17 C) 20 D) 24 E) 28

13. If sum of the first *n* terms of an arithmetic sequence is $S_n = 16n - n^2$, find the seventh term of this sequence.

A) 5 B) 3 C) 1 D) –1 E) –3

14. Sum of the first n terms of a geometric series is given by $S_n = 3.5^n - 3$. Ratio of this geometric series is...

A) 3 B) 4 C) 5 D) 15 E) 28

15. Sum of the infinite geometric series 16 + 8 + 4 + 2 + 1 + ... is...

A) 30 B) 32 C) 34 D) 36 E) 40

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