

Sequences & Series

1

Partial Sum:

Series:

Sigma Notation:

Sequence:

Recursive:

2

Essential Question:

Ex 1. 1, 3, 5, 7, 9

Ex 2. Find the first 4 terms & the 100th term

A. $a_n = \frac{1}{2^n}$

B. $a_n = (-1)^n$

C. $a_n = (-1)^{n+1}$

Recursive Sequence

Ex 3. $a_n = a_{n-1} + 3$ $a_1 = 1$

Partial Sums

Ex 4. Find S_1 , S_2 , & S_3 for $a_n = 2n + 3$

Series & Summation Notation

Ex 5. $\sum_{x=4}^{10} 2x$

Ex 6. $\sum_{i=3}^5 i^2 + 2$

Ex 7. Write in sigma notation $3^3 + 3^4 + 3^5 + \dots + 3^{20}$

Summary:

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Question/
Cue Column

Arithmetic Sequences and Series

Essential Question:

Direct Formula:

Ex 1. 2, 5, 8, 11, ...

Ex 2. 4, 8, 12, 16, ...

Ex 3. Find the n th term for 7, 5, 3, ...

Series

Partial Sum Formulas

Ex 4. Find the sum of the first 30 odd numbers.

Summary:

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Essential Question:

Direct Formula:

Ex 1. 2, 4, 8, 16, ...

Ex 2. 18, 6, 2, ...

Ex 3. Find the nth term $-3, 1, -\frac{1}{3}, \frac{1}{9}, \dots$

Series

Partial Sum Formula

Ex 4. Find the sum of the series $3 + 6 + 12 + 24 + \dots + 768$

Infinite Geometric Series

$$1 + 2 + 4 + 8 + 16 + \dots \quad \text{vs.} \quad \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \dots$$

* If $|r| < 1$...

Ex 5. $1 + -3 + 9 + -27 + \dots$

Ex 6. $27 + 9 + 3 + 1 + \dots$

Summary:

Unit 2 Formulas

$$a_n = a + d(n-1) \quad S_n = \frac{n}{2}[2a + d(n-1)]$$

$$S_n = a \left(\frac{1-r^n}{1-r} \right) \quad a_n = a(r)^{n-1}$$

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$$S_n = n \left(\frac{a + a_n}{2} \right) \quad S = \frac{a}{1-r}$$

$$\binom{n}{r} = \frac{n!}{r!(n-r)!}$$

Essential Question:

$(a+b)^0$

$(a+b)^1$

$(a+b)^2$

$(a+b)^3$

Binomial Expansion Theorem

$$(a + b)^n = \sum_{k=0}^n \binom{n}{k} a^{n-k} b^k$$

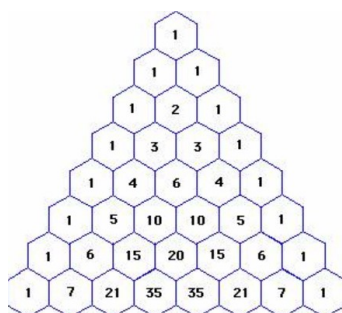
- Coefficients

Combination Notation & Formula

$$\binom{n}{k} = \frac{n!}{k!(n-k)!}$$

Ex. $\binom{8}{5}$

Coefficients & Pascal's Triangle



Ex. $\binom{5}{3}$

- Exponents

Examples

1. Expand $(x + 2)^5$

2. Find the 7th term of $(x^2+2y)^{10}$

Summary: