Unit 14: Sequences and Series

(Chapter 14, page 610)

Serious material from this chapter:

Arithmetic and geometric sequences.

Sum notation:

$$\sum_{n=1}^{10}(2n+1)$$

Gauss formula for $1+2+3+\cdots 100$.

Infinite sum.

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☐	A sequence is _____ ---- Infinite sequence ---- Term ---- n'th term	Definition Page 612
☐	General term a_n ---- Implicit formula (recursive) ---- Explicit formula ---- Examples ---- $1, 8, 27, 64, 125, \ldots$ Find implicit: ---- $1, 2, 4, 8, 16, \ldots$ Find implicit AND explicit:	
☐	Series ---- $S_n =$ _____	Definition Page
☐	Sigma notation: $$S_n = \sum_{n=1}^{5} (2n + 1)$$ Read: "The sum as _____ goes from 1 to _____ of _____ " ---- Examples	Page 614
☐	Infinite series: $$S_n = \sum_{n=1}^{\infty} a_n$$	

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☐	**Arithmetic sequence and series**	
☐	Arithmetic sequence: The <u>difference</u> between consecutive elements is the constant d . The constant d is called the _____ ---- Examples:	Definition Page 617
☐	n'th term of arithmetic sequence: $$a_n = a_1 + (n-1)d$$ ---- Examples: -- Find d: _____ -- Given arithmetic sequence with $a_3 = 8$, $a_{16} = 47$. Find a_1 and d _____	Theorem 14-1
☐	Arithmetic series $$S_n = (a_1 + a_n) \cdot \frac{n}{2}$$ ---- Examples: -- Find the sum of $1, 2, 3, 4, \ldots, 99, 100$. 1. Is this arithmetic? 2. What are a_1, d? 3. Solve? -- Your example:	Theorem 14-2

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	Geometric sequence and series	
☐	Geometric sequence: The <u>ratio</u> between consecutive elements is the constant r . The constant r is called the _____ ---- Examples:	Definition Page 624
☐	n'th term of geometric sequence: $$a_n = a_1 \cdot r^{n-1}$$ ---- Examples: -- Find 11'th term of the sequence $64, -32, 16, -8, \ldots$	Theorem 14-4
☐	Geometric series $$S_n = \frac{a_1 \cdot (1 - r^n)}{1 - r}$$ ---- Examples: $$\sum_{n=1}^{5} \left(\frac{1}{2}\right)^{n+1} =$$ 1. Write first 3 terms 2. Is this arithmetic or geometric series? 3. Solve. -- Your example:	Theorem 14-5

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☐	Infinite geometric sum $$S = \frac{a_1}{1 - r} \qquad |r| < 1$$ ---- Examples: $$\sum_{n=1}^{\infty} \left(\frac{1}{2}\right)^{n-1} =$$ 1. Write first 3 terms 2. Is this arithmetic or geometric series? 3. if $|r| < 1$, use the formula	Theorem 14-7

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