I. OBJECTIVES	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Learning Competencies/ Objectives:	1. Execute the steps in finding the rule of a given arithmetic sequence; 2. Find the next terms of a given arithmetic sequence; and, 3. Project interest and enjoyment in solving problems.	1. State the steps in finding the arithmetic mean; 2. Generate the arithmetic mean given two terms of a sequence; and, 3. Display interest and willingness in solving problems.	1. Derive the formula in computing arithmetic series; 2. Compute the number of terms of a given arithmetic series; and, 3. Display enjoyment and independence in solving problems.	1. Apply the steps in finding the rule of a given geometric sequence; 2. Generate the next terms of a geometric sequence; and, 3. Display determination and interest in solving problems.	1. Apply the steps in finding the rule of a given geometric sequence; 2. Generate the next terms of a geometric sequence; and, 3. Display enjoyment and interest in solving problems.
II. CONTENT	**PATTERNS AND ALGEBRA**				
	Arithmetic Sequences	**Arithmetic Means**	**Arithmetic Series**	**Geometric Sequences**	**Finite Geometric Series**
III. LEARNING RESOURCES					
A. References					
1. Teacher's Guide Pages	pp. 11–21	pp. 22–30	pp. 31–41	pp. 42–50	pp. 51–62
2. Learner's Materials Pages	pp. 7–13	pp. 14–18	pp. 19–25	pp. 26–30	pp. 31–37
3. Textbook Pages	pp. 9–18	pp. 19–25	pp. 26–35	pp. 36–42	pp. 43–52
4. Additional Materials from Learning Resources Portal					
B. Other Learning Resources	Flashcards	Flashcards	Flashcards	Flashcards	Flashcards
IV. PROCEDURES					

A. Reviewing Previous Lesson or Presenting New Lesson	Arithmetic Sequences	Arithmetic Means	Arithmetic Series	Geometric Sequences	Finite Geometric Series

	Arithmetic Sequence: a sequence where every term after the first is obtained by adding a constant called the common difference
	
	Common difference: the constant difference d between any two consecutive terms
	
	To find any term in an arithmetic sequence, use
	
	$$a_n = a_1 + (n-1)d$$
	
	To find d, use
	
	$$d = \frac{a_n - a_k}{n - k}$$
		Arithmetic Extremes: the first and last terms of a finite arithmetic sequence
		
		Arithmetic Means: the terms between the arithmetic extremes
		
		Average: the arithmetic mean between two numbers
		
		To insert more than one arithmetic mean, use the difference formula d.
		
		$$d = \frac{a_n - a_k}{n - k}$$
			Arithmetic Series: the indicated sum of the terms of an arithmetic sequence
			
			If the first term and the nth term are given, then
			
			$$S_n = \frac{n}{2}(a_1 + a_n)$$
			
			If the nth term is not given, then
			
			$$S_n = \frac{n}{2}[2a_1 + (n-1)d]$$
				Geometric Sequence: a sequence in which each term after the first is obtained by multiplying the preceding term by a fixed nonzero constant
				
				Common Ratio (r)**:** the fixed constant
				
				To find any term in a geometric sequence, use
				
				$$a_n = a_1 r^{n-1}$$
					Finite Geometric Series: the indicated sum of the terms of a geometric sequence
					
					If the last term a_n is not given, use
					
					$$S_n = \frac{a_1(1 - r^n)}{1 - r}, \quad r \neq 1$$
					
					If the last term a_n is given, use
					
					$$S_n = \frac{a_1 - a_n r}{1 - r}, \quad r \neq 1$$

B. Establishing a Purpose for the Lesson	The purpose of this lesson is to enable the students to solve real life problems involving arithmetic sequences.	The purpose of this lesson is to enable the students to solve real life problems involving arithmetic means.	The purpose of this lesson is to enable the students to solve real life problems involving arithmetic series.	The purpose of this lesson is to enable the students to solve real life problems involving geometric sequences.	The purpose of this lesson is to enable the students to solve real life problems involving finite geometric series.

C. Discussing New Concepts and Practicing New Skills #1	Practice Exercises	Practice Exercises	Practice Exercises	Practice Exercises	Practice Exercises

	A. Find the specified term of each arithmetic sequence.
	
	1. $2,5,8,\ldots$ a_4
	    $y, x, 2x-y,\ldots$ a_{10}
	2. $-11,-7,-3,\ldots$ a_{23}
	3. $10,-2,5.14,\ldots 3, 3.25, 3.5,\ldots$
		Insert the indicated number of arithmetic means between the given arithmetic extremes.
		
		1. 2 and 32 [1]
		2. a_{16} -12 and 6 [3]
		3. 68 and 3 [4]
		4. 15x and 23x [1]
		5. $9\sqrt{3}$ and $11\sqrt{3}$ [1]
		6. $2\sqrt{5}$ and $14\sqrt{5}$ [2]
		7. $\dfrac{3}{7}$ and $\dfrac{11}{7}$ [1]
			A. Find the sum of each arithmetic sequence.
			
			1. 2, 5, 8,... to 8 terms
			2. -11, -7, -3,... to 23 terms
			3. Sum of odd integers from 1 to 100
			4. Sum of the integers between 50 and 200 which are divisible by 5
				A. Find the common ratio and the next three terms of each geometric sequence.
				
				1. $2,6,18,54,\ldots$ $4,12,36,\ldots$
				    $0.02,0.2,2,\ldots$
				2. $\dfrac{1}{8},\dfrac{1}{4},\dfrac{1}{2},\ldots$ $3x^3, 6x^5, 12x^7,\ldots$
				
				B. Find the specified term of each geometric sequence.
				
				1. $3,6,12,\ldots$ a_7
				2. $4,20,100,\ldots$ a_8
				3. $7,-7,7,\ldots$ a_{17}
				4. $3,1.2,0.48,\ldots$ a_{10}
				5. $1,\dfrac{3}{2},\dfrac{9}{4},\ldots$ a_{11}
					A. Find the indicated sum of the following geometric series.
					
					1. $1 + 4 + 16 +\ldots S_6$
					2. $2 + 4 + 8 + 16 +\ldots S_8$
					3. $2 + 6 + 18 +\ldots S_7$
					4. $(-9) + 6 + (-4) +\ldots S_8$
					5. $2 + 2\sqrt{2} + 4 + 18 +\ldots S_{10}$

D. Discussing New Concepts and Practicing New Skills #2	B. Find the specified term.		B. In each arithmetic series, find the specified unknown.	Solve each problem completely.	B. Find each specified term.
	1. 18th term of the arithmetic sequence if $a_1 = 25$ and $d = -2$.		1. $S_n = 90$, $a_1=10$, $a_n=26$, $n=?$	1. The first term of a geometric sequence is 8, and the second term is 4. Find the fifth term.	1. $S_5 = \dfrac{31}{4}$; $r = \dfrac{1}{2}$; $a_1 =?$
	2. 11th term if $a_1 = -15$ and $d = 6$.		2. $S_n = 1{,}800$, $a_n=185$, $n=18$, $a_1=?$	2. The first term of a geometric sequence is 3, and the third term is $\frac{4}{3}$. Find the fifth term.	2. $S_8 = 2{,}550$; $r = 2$; $a_1 =?$
	3. In the sequence 2, 6, 10,..., what term has a value of 106?		3. $S_n = 119$, $a_1=5$, $d=4$, $n=?$	3. The common ratio in a geometric sequence is $\frac{2}{5}$ and the fourth term is $\frac{5}{2}$. Find the third term.	3. $S_7 = 7{,}651$; $r = 3$; $a_1 =?$
	4. In the sequence 7, 4, 1,..., what term has a value of -296?		4. $a_{10} = 27.5$, $d=3$, $a_1=?$, $S_n=?$		4. $S_{10} = 51{,}150$; $r = 2$; $a_1 =?$
	5. If $a_{11} = 110$ and $a_{28} = 280$, find a_{21}.			4. Which term of the geometric sequence 2, 6, 18,... is 118098?	5. $S_6 = 126$; $r = -\dfrac{1}{2}$; $a_6 =?$
	6. If $a_{10} = 14$ and $a_{37} = 122$, find a_{25}.			5. The second and fifth terms of a geometric sequence are 10 and 1250, respectively. Is 31,250 a term of this sequence? If so, which term is it?	

E. Developing Mastery	Problem Set	Problem Set	Problem Set	Problem Set	Problem Set
	A. Find the specified term of each arithmetic sequence. 1. $3, 5, 7, \ldots$ a_{21} 2. $1.4, 4.5, 7.6, \ldots$ a_{51} 3. $x - 2, 4x, 7x + 2, \ldots$ a_{12} 4. $14, 6, -2, \ldots$ a_{28} 5. $5, -1, -7, \ldots$ a_{18} B. Find the specified term. 1. 17th term of the sequence if $a_8 = 5$ and $a_{21} = -60$. 2. 5th term of the sequence if $a_{15} = 29$ and $a_{27} = 47$. 3. If $a_{24} = 85$ and $a_{28} = 100$, $a_1 = ?$ 4. If $a_1 = -4$ and $a_{25} = -100$, $a_{101} = ?$	Insert the indicated number of arithmetic means between the given arithmetic extremes. 1. -5 and 1 [2] 2. 24 and -12 [3] 3. 8 and 23 [4] 4. $4x$ and $-16x$ [4] 5. $6\sqrt{5}$ and $12\sqrt{5}$ [1] 6. $-3\sqrt{3}$ and $15\sqrt{3}$ [5] 7. $\dfrac{1}{2}$ and 2 [2]	A. Find the sum of each arithmetic sequence. 1. $3, 5, 7, \ldots$ to 31 terms 2. $10, -2, -14, \ldots$ to 17 terms 3. Sum of even integers from 10 to 90 4. Sum of the integers between 2 and 100 which are divisible by 3 B. In each arithmetic series, find the specified unknown. 1. $S_n = 50$, $a_1 = 4$, $a_n = 16$, $n = ?$ 2. $S_n = 195$, $a_n = 33$, $d = 3$, $a_1 = ?$ 3. $S_n = -15$, $a_1 = 12$, $d = -3$, $n = ?$ 4. Sum of odd integers from 1 to 100	A. Find the common ratio and the next three terms of each geometric sequence. 1. $4, 8, 16, 32, \ldots$, $1, -5, 25, \ldots$ 4. $-5, -0.5, -0.05, \ldots$ 2. $\dfrac{4}{9}, \dfrac{4}{3}, 4, \ldots$, $x, 5x^2 y, 25x^3 y^2, \ldots$ B. Find the specified term of each geometric sequence. 1. $64, -32, 16, \ldots$ a_7 2. $2, -10, 50, \ldots$ a_8 3. $2, -6, 18, \ldots$ a_{13} 4. $3, 1.2, 0.48, \ldots$ a_{10} 5. $\dfrac{1}{16}, \dfrac{1}{8}, \dfrac{1}{4}, \ldots$ a_9 C. Solve each problem completely. 1. The first term of a geometric sequence is -2, and the third term is $-\frac{1}{2}$. Find the fifth term. 2. The common ratio in a geometric sequence is $\frac{2}{3}$ and the fourth term is 1. Find the …	A. Find the indicated sum of the following geometric series. 1. $9 + 6 + 4 + (-2) + \ldots S_7$ 4. $1 + 4 + 4 + (-8) \ldots S_8$ 2. $8 + 32 + \ldots S_9$ 5. $(-2) + \ldots S_6$ 3. $3 + 6 + 3\sqrt{3} + (-18) + 9 + \ldots S_9$ B. Find the sum of the first n terms of the related geometric series. 1. $a_1 = \dfrac{1}{2}$; $r = \dfrac{1}{2}$; $n = 7$ 4. $a_1 = 6$; 168; $r = \dfrac{3}{4}$; $n = 5$ 2. $a_1 = \dfrac{3}{4}$; $r = 8$; $n = 13$ 5. $a_1 = 4$; $r = 4$; $n = 7$ 3. $a_1 = -5$; $r = 8$; $n = 318$

F. Finding Practical Application of Concepts and Skills in Daily Living	Let the students answer the following questions: 1. In what real life situations or problems can we observe some examples of arithmetic sequences? 2. How can you apply your knowledge of arithmetic sequences in solving these real life problems?	Let the students answer the following questions: 1. In what real life situations or problems can we observe some examples of arithmetic means? 2. How can you apply your knowledge of arithmetic means in solving these real life problems?	Let the students answer the following questions: 1. In what real life situations or problems can we observe some examples of arithmetic series? 2. How can you apply your knowledge of arithmetic series in solving these real life problems?	Let the students answer the following questions: 1. In what real life situations or problems can we observe some examples of geometric sequences? 2. How can you apply your knowledge of geometric sequences in solving these real life problems?	Let the students answer the following questions: 1. In what real life situations or problems can we observe some examples of finite geometric series? 2. How can you apply your knowledge of finite geometric series in solving these real life problems?
G. Making Generalization and Abstractions about the Lesson	Let the students answer the following questions: 1. In your own words, what are arithmetic sequences? 2. How do we solve problems involving arithmetic sequences?	Let the students answer the following questions: 1. In your own words, what are arithmetic means? 2. How do we solve problems involving arithmetic means?	Let the students answer the following questions: 1. In your own words, what are arithmetic series? 2. How do we solve problems involving arithmetic series?	Let the students answer the following questions: 1. In your own words, what are geometric sequences? 2. How do we solve problems involving geometric sequences?	Let the students answer the following questions: 1. In your own words, what are finite geometric series? 2. How do we solve problems involving finite geometric series?

H. Evaluating Learning	**Quiz #1** Find the specified term. 1. The 101th term of the arithmetic sequence if a_1=-5 and d=-4. 2. The 39th term of the arithmetic sequence if $a_1 = 40$ and $d = \frac{1}{2}$. 3. In the sequence 6, 10, 14,..., what term has a value of 286? 4. The 1st term of the sequence if $a_5 = 26$ and $a_{12} = 47$. 5. The 61th term of the sequence if $a_4 = 8$ and $a_{21} = 26$.				
I. Additional Activities for Application or Remediation					
VI. REMARKS	Objectives have been attained: _____ Objectives were not attained due to: _____	Objectives have been attained: _____ Objectives were not attained due to: _____	Objectives have been attained: _____ Objectives were not attained due to: _____	Objectives have been attained: _____ Objectives were not attained due to: _____	Objectives have been attained: _____ Objectives were not attained due to: _____
VII. REFLECTION					
A. No. of learners who earned 80% in the evaluation	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____

B. No. of learners who require additional activities for remediation who scored below 80%	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____	10–Bohr: _____ out of _____ 10–Avogadro: _____out of _____	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____	10–Bohr: _____out of _____ 10–Avogadro: _____out of _____
C. Did the remedial lessons work? No. of learners who have caught up with the lesson	10–Bohr: _____ 10–Avogadro: _____	10–Bohr: _____ 10–Avogadro: _____	10–Bohr: _____ 10–Avogadro: _____	10–Bohr: _____ 10–Avogadro: _____	10–Bohr: _____ 10–Avogadro: _____
D. No. of learners who continue to require remediation	10–Bohr: _____ 10–Avogadro: _____	10–Bohr: _____ 10–Avogadro: _____	10–Bohr: _____ 10–Avogadro: _____	10–Bohr: _____ 10–Avogadro: _____	10–Bohr: _____ 10–Avogadro: _____
E. Which of my teaching strategies worked well? Why did these work?					
F. What difficulties did I encounter which my principal or supervisor can help me solve?					
G. What innovation or localized materials did I use/discover which I wish to share with other teachers?					

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