GRADES 1 to 12 DAILY LESSON LOG	School	Sauyo High School	Grade Level	Grade 10
	Teacher	Mr. Jonathan R. Bacolod, LPT	Learning Area	Mathematics
	Teaching Dates and Time	Week 8, July 22 – 26, 2019	Quarter	1st

I. OBJECTIVES	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Learning Competencies/ Objectives:	1. Describe the similarities between harmonic sequences and arithmetic sequences; 2. Calculate the next terms of a given harmonic sequence; and, 3. Project independence and interest in solving problems.	1. Describe the steps in finding the next terms of a fibonacci sequence; 2. Solve the next terms of a fibonacci sequence; and, 3. Show willingness and interest in solving problems.	1. Describe the steps in finding the next terms of a polynomial function; 2. Solve the next terms of a polynomial function; and, 3. Show willingness and perseverance in solving problems.	1. Describe the steps in finding the next terms of a synthetic division; 2. Generate the next terms of a synthetic division; and, 3. Show willingness and determination in solving problems.	1. Describe the steps in finding the next terms of a remainder theorem; 2. Find the next terms of a remainder theorem; and, 3. Show willingness and self-reliance in solving problems.
II. CONTENT	**PATTERNS AND ALGEBRA**				
	Harmonic Sequence	**Fibonacci Sequence**	**Polynomial Function**	**Synthetic Division**	**Remainder Theorem**
III. LEARNING RESOURCES					
A. References					
1. Teacher's Guide Pages	pp. 83–91	pp. 83–91	pp. 62–66	pp. 67–73	pp. 74–78
2. Learner's Materials Pages	pp. 50–54	pp. 50–54	pp. 52–55	pp. 56–61	pp. 62–65
3. Textbook Pages	pp. 70–76	pp. 70–76	pp. 62–66	pp. 67–73	pp. 74–78
4. Additional Materials from Learning Resources Portal					
B. Other Learning Resources	Flashcards	Flashcards	Flashcards	Flashcards	Flashcards
IV. PROCEDURES					

<table>
<tr>
<th>A. Reviewing Previous Lesson or Presenting New Lesson</th>
<th>Harmonic Sequence</th>
<th>Fibonacci Sequence</th>
<th>Polynomial Function</th>
<th>Synthetic Division</th>
<th>Remainder Theorem</th>
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<td>Harmonic Sequence: a sequence of numbers whose reciprocals form an arithmetic sequence
In symbols,
$$\frac{1}{a_1}, \frac{1}{a_1+d}, \frac{1}{a_1+2d}, \ldots, \frac{1}{a_1+(n-1)d}$$</td>
<td>Fibonacci Sequence: a sequence in which the terms are found by adding the two previous terms
In symbols,
$$F_n = F_{n-1} + F_{n-2}, \quad n > 2$$</td>
<td>Polynomial: a special kind of algebraic expression where each term is a constant, a variable, or a product of constants and variables raised to whole number exponents
An algebraic expression is not a polynomial when there are square roots of variables, negative powers, and variables in the denominator of any fraction.
Polynomial Function: a function defined by
$$p(x) = a_nx^n + a_{n-1}x^{n-1} + a_{n-2}x^{n-2} + \ldots + a_0$$
where n is a positive integer
Degree of a Polynomial Function: the largest power of x that appears in the polynomial
Leading Coefficient: the first nonzero coefficient when a polynomial function is arranged in descending order
<table>
<tr><th>Polynomial Function</th><th></th><th>Degree</th></tr>
<tr><td>Zero Function</td><td></td><td>None</td></tr>
<tr><td>Constant Function</td><td></td><td>0</td></tr>
<tr><td>Linear Function</td><td></td><td>1</td></tr>
<tr><td>Quadratic Function</td><td></td><td>2</td></tr>
<tr><td>Cubic Function</td><td></td><td>3</td></tr>
<tr><td>Quartic Function</td><td></td><td>4</td></tr>
<tr><td>Quintic Function</td><td></td><td>5</td></tr>
<tr><td>n^{th} degree Polynomial Function</td><td></td><td>n</td></tr>
</table></td>
<td>Division Algorithm: If $P(x)$ and $D(x)$ are polynomials and $D(x) \neq 0$, then there exists a unique polynomial $Q(x)$ and R such that
$$P(x) = D(x) \cdot Q(x) + R$$
Dividend = Divisor · Quotient + Remainder
Steps for Synthetic Division
1. Set up the synthetic division.
2. Bring down the leading coefficient to the bottom row.
3. Multiply c by the value just written on the bottom row.
4. Add the column created in step 3.
5. Repeat until done.
6. Write out the answer.</td>
<td>Remainder Theorem: If a polynomial $P(x)$ is divided by $x - c$, then the remainder is $P(c)$.
$$R = P(c)$$
Ways to Find the Remainder:
1. Use synthetic division.
2. Calculate $P(c)$.</td>
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B. Establishing a Purpose for the Lesson	The purpose of this lesson is to enable the students to solve real life problems involving harmonic sequence.	The purpose of this lesson is to enable the students to solve real life problems involving fibonacci sequence.	The purpose of this lesson is to enable the students to solve real life problems involving polynomial function.	The purpose of this lesson is to enable the students to solve real life problems involving synthetic division.	The purpose of this lesson is to enable the students to solve real life problems involving remainder theorem.

C. Discussing New Concepts and Practicing New Skills #1	**Practice Exercises**	**Practice Exercises**	**Practice Exercises**	**Practice Exercises**	**Practice Exercises**
	A. Write *Yes* if the sequence is harmonic. Otherwise, write *Not*. 1. $\frac{1}{5},\frac{1}{8},\frac{1}{11}$ 2. $\frac{1}{5},\frac{1}{10},\frac{1}{15}$ 3. $\frac{1}{2},\frac{3}{8},\frac{3}{10}$ 4. $\frac{1}{2},\frac{1}{4},\frac{1}{6}$ 5. $-\frac{1}{2},\frac{1}{2},\frac{1}{6}$ B. Find the specified term of each harmonic sequence. 1. $\frac{4}{3},2,4,\ldots a_7$ 2. $\frac{1}{3},\frac{3}{10},\frac{3}{11},\ldots a_9$ 3. $a_1 = 6, a_2 = 7, a_n = 25, n =?$ 4. $a_1 = \frac{1}{15}, a_{10} = \frac{1}{27}, a_7 =?$ 5. $a_8 = 4, a_{14} = \frac{4}{19}, a_{13} =?$	Find the missing terms of each sequence. 1. 6, 6, 12, _____, _____, _____ 2. 0.3, 0.3, _____, _____, _____ 3. 5, 5, 10, _____, _____, _____ 4. $\sqrt{2},\sqrt{2}$, _____, _____, _____ 5. 6, _____, _____, 18, _____	A. Determine which of the following are polynomial functions. 1. $f(x) = 2x-1$ 2. $h(x) = 4^x - 7$ 3. $F(x) = 7+5x^{-2}+4x^5$ 4. $f(x) = -x^5+7x^2-4+x^{\frac{1}{2}}$ 5. $h(x) = \frac{5+x^3}{7}$	A. Divide the polynomials using the long method. Express your answer as $P(x) = D(x)\cdot Q(x)+R$. 1. $(x^3-7x-6)\div(x-2)$ 2. $(4x^2+5x+8)\div(x+1)$ 3. $(10x^4+5x^3+4x^2-9)\div(x+1)$ 4. $(2x^4-6x^3+x^2-3x-3)\div(x-3)$ 5. $(4x^4+5x^3+2x^2-1)\div(x+1)$	A. Use synthetic division to find the remainder of the following polynomial functions. 1. $f(x) = -x^3+6x-7$ at $x=2$ 2. $f(x) = x^3+3x^2+2x+8$ at $x=-3$ 3. $f(x) = x^4+3x^3-17x^2+2x-7$ at $x=3$ 4. $f(x) = 3x^3+7x^2-18x+8$ at $x=-4$ 5. $f(x) = 2x^4-3x^3-3x-2$ at $x=2$

D. Discussing New Concepts and Practicing New Skills #2	C. Find the harmonic mean between the two given numbers. 1. 40 and 60 2. 80 and 120 3. -30 and 60 4. $-\frac{3}{7}$ and $\frac{5}{6}$		B. Determine the kind of function, the degree, the leading coefficient, and the constant term. 1. $P(x) = -4x^3 - 15x + 6 + 7x^5$ 2. $G(x) = 3x^4 - 5x^6 + 8x^2 - 4x^3$ 3. $f(x) = 9 - 3x^2 - 3x + 6x^4$ 4. $h(x) = x(2x-3)^2$ 5. $F(x) = \frac{2x - 5x^5 + 7x}{3}$	B. Divide the polynomials using synthetic division. Express your answer as $P(x) = D(x) \cdot Q(x) + R$. 1. $(5x^2 - 10x - 47) \div (x - 4)$ 2. $(x^3 - x^2 - x - 2) \div (x - 2)$ 3. $(x^4 + 9x^3 + 4x^2 + 50x + 9) \div (x + 8)$ 4. $(x^4 - 8x^3 + 10x^2 + 2x + 4) \div (x - 2)$ 5. $(x^5 + 6x^4 - 3x^2 - 22x - 29) \div (x + 6)$	B. Use the remainder theorem to find the remainder of the following polynomial functions. 1. $f(x) = 4x^3 + 2x + 10$ at $x = -3$ 2. $f(x) = 2x^3 + 4x^2 - 5x + 9$ at $x = -3$ 3. $f(x) = 3x^3 - 7x^2 + 5x - 2$ at $x = -2$ 4. $f(x) = 5x^3 + 7x^2 + 8$ at $x = -2$ 5. $f(x) = 6x^2 + 3x - 9$ at $x = 1$

E. Developing Mastery	Problem Set	Problem Set	Problem Set	Problem Set	Problem Set
	A. Write *Yes* if the sequence is harmonic. Otherwise, write *Not*. 1. $\frac{1}{3}, \frac{2}{3}, 1$ 2. $\frac{1}{4}, \frac{1}{7}, \frac{1}{9}$ 3. $\frac{1}{8}, \frac{3}{8}, \frac{5}{11}$ 4. $\frac{4}{7}, \frac{1}{2}, \frac{3}{2}$ 5. $\frac{1}{5}, \frac{6}{5}, \frac{11}{5}$ B. Find the specified term of each harmonic sequence. 1. $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \ldots a_7$ 2. $\frac{1}{5}, \frac{1}{10}, \frac{1}{15}, \ldots a_{10}$ 3. $\frac{1}{4}, \frac{1}{11}, \frac{1}{18}, \ldots a_9$ 4. $-\frac{1}{10}, -\frac{1}{3}, \frac{1}{4}, \ldots a_{14}$ 5. $1, \frac{2}{3}, \frac{1}{2}, \frac{2}{5}, \ldots a_{10}$ C. Find the harmonic mean between the two given numbers. 1. 20 and 4 2. 10 and 5 3. 15 and 45 4. 9 and 25	Find the missing terms of each sequence. 1. 2, 2, 4, _____, _____ 2. 0.2, 0.2, _____, _____ 3. $\frac{1}{4}, \frac{1}{4}, \frac{1}{2}$, _____, _____ 4. 5x, _____, 10x, _____ 5. _____, $\frac{3}{2}$, _____, $\frac{9}{2}, \frac{15}{2}$ 6. _____, 2, 3, 5, _____, _____ 7. 0.5, _____, 1, _____, _____ 8. $\frac{1}{16}, \frac{1}{16}$, _____, _____, _____ 9. 3x, 7x, _____, _____, _____ 10. _____, $\frac{5}{3}$, _____, 5, _____	A. Determine which of the following are polynomial functions. 1. $f(x) = 3x^2 + 5$ 2. $h(x) = 5x^3 + x - 3$ 3. $F(x) = \frac{3x^2}{2x^3}$ 4. $f(x) = 6x(x^2 - 1)$ 5. $h(x) = \sqrt{x^7 + 3x^6 - 4x}$ B. Determine the kind of function, the degree, the leading coefficient, and the constant term. 1. $P(x) = -11 + x^4 - 3x^2$ 2. $G(x) = \frac{1}{2}x^2 + 4x^3 + 5$ 3. $f(x) = 5\sqrt{3}x - 7 + 2x^2$ 4. $h(x) = 7.5x^{10} - 3x^4 + 11x^8$ 5. $F(x) = x(5x^3 + 7)$	A. Divide the polynomials using the long method. Express your answer as $P(x) = D(x) \cdot Q(x) + R$. 1. $(x^3 - 14x + 8) \div (x + 4)$ 2. $(x^2 + 10) \div (x + 4)$ 3. $(x^3 + 8x^2 - 3x + 16) \div (x + 5)$ 4. $(x^4 - 6x^3 - 40x + 33) \div (x - 7)$ 5. $(-10x^5 + 3x - 7) \div (x - 1)$ B. Divide the polynomials using synthetic division. Express your answer as $P(x) = D(x) \cdot Q(x) + R$. 1. $(8x^2 + 30x - 11) \div (x + 4)$ 2. $(x^4 - 8x^3 - x^2 + 62x - 34) \div (x - 7)$ 3. $(x^4 + 6x^3 + 11x^2 + 29x - 13) \div (x + 5)$ 4. $(x^5 - 25x^3 - 7x^2 - 37x - 18) \div (x + 5)$ 5. $(x^4 + 10x^3 + 21x^2 + 6x - 8) \div (x + 2)$	A. Use synthetic division to find the remainder of the following polynomial functions. 1. $f(x) = x^3 + x^2 - 5x - 6$ at $x = 2$ 2. $f(x) = x^3 + 5x^2 + 10x + 12$ at $x = -2$ 3. $f(x) = x^5 - 47x^3 - 16x^2 + 8x + 52$ at $x = 7$ 4. $f(x) = x^4 - 2x^3 + x^2 - 4$ at $x = -1$ 5. $f(x) = x^2 - 5x - 2$ at $x = -2$ B. Use the remainder theorem to find the remainder of the following polynomial functions. 1. $f(x) = 2x^3 - 5x^2 + 3x - 7$ at $x = 3$ 2. $f(x) = 2x^3 - 9x^2 + 14x - 8$ at $x = -2$ 3. $f(x) = 4x^4 + 5x^3 + 8x^2$ at $x = 4$ 4. $f(x) = 5x^4 + 6x^3 + 10x^2$ at $x = 5$ 5. $f(x)$

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 harmonic sequence? 2. How can you apply your knowledge of harmonic sequence 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 fibonacci sequence? 2. How can you apply your knowledge of fibonacci sequence 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 polynomial function? 2. How can you apply your knowledge of polynomial function 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 synthetic division? 2. How can you apply your knowledge of synthetic division 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 remainder theorem? 2. How can you apply your knowledge of remainder theorem 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 is a harmonic sequence? 2. How do we solve problems involving harmonic sequence?	Let the students answer the following questions: 1. In your own words, what is a fibonacci sequence? 2. How do we solve problems involving fibonacci sequence?	Let the students answer the following questions: 1. In your own words, what is a polynomial function? 2. How do we solve problems involving polynomial function?	Let the students answer the following questions: 1. In your own words, what is a synthetic division? 2. How do we solve problems involving synthetic division?	Let the students answer the following questions: 1. In your own words, what is a remainder theorem? 2. How do we solve problems involving remainder theorem?
H. Evaluating Learning					
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?					

Checked by:

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