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 9, July 29 – August 2, 2019	**Quarter**	1st

I. OBJECTIVES	**DAY 1**	**DAY 2**	**DAY 3**	**DAY 4**	**DAY 5**
Learning Competencies/ Objectives:	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 a polynomial function; 2. Determine the kind, the degree, the leading coefficient, and the constant term of a polynomial function; and, 3. Exhibit patience and self-reliance in solving problems.	1. Reiterate the steps in dividing polynomials using synthetic division; 2. Divide polynomials using synthetic division; and, 3. Show independence and interest in solving problems.	1. Demonstrate the remainder theorem; 2. Compute the remainder of a polynomial using the remainder theorem; and, 3. Exhibit determination and self-reliance in solving problems.	1. Discuss the factor theorem; 2. Use the factor theorem to determine whether a binomial is a factor of a given polynomial; and, 3. Exhibit perseverance and interest in solving problems.
II. CONTENT	**PATTERNS AND ALGEBRA**				
	Fibonacci Sequence	**Polynomial Function**	**Synthetic Division**	**Remainder Theorem**	**Factor Theorem**
III. LEARNING RESOURCES					
A. References					
1. Teacher's Guide Pages	pp. 83–91	pp. 62–66	pp. 67–73	pp. 74–78	pp. 79–85
2. Learner's Materials Pages	pp. 50–54	pp. 52–55	pp. 56–61	pp. 62–65	pp. 66–71
3. Textbook Pages	pp. 70–76	pp. 62–66	pp. 67–73	pp. 74–78	pp. 79–85
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

Fibonacci Sequence

Fibonacci Sequence: a sequence in which the terms are found by adding the two previous terms

In symbols,

$$F_n = F_{n-1} + F_{n-2}, \quad n > 2$$

Polynomial Function

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

$$p(x) = a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \ldots + a_2 x^2 + a_1 x + a_0$$

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

Polynomial Function	Degree
Zero Function	None
Constant Function	0
Linear Function	1
Quadratic Function	2
Cubic Function	3
Quartic Function	4
Quintic Function	5
n^{th} degree Polynomial Function	n

Synthetic Division

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.

Remainder Theorem

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 $P(c)$.

Factor Theorem

Factor Theorem: If $P(x)$ is a polynomial and $P(c) = 0$, then $x - c$ is a factor of $P(x)$. Conversely, if $x - c$ is a factor of $P(x)$, then $P(c) = 0$.

B. Establishing a Purpose for the Lesson	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 functions.	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 the remainder theorem.	The purpose of this lesson is to enable the students to solve real life problems involving the factor theorem.
C. Discussing New Concepts and Practicing New Skills #1	**Practice Exercises** 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, _____	**Practice Exercises** 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. $h(x) = \dfrac{5 + x^3}{7}$	**Practice Exercises** 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. $(4x^4 + 5x^3 + 2x^2 - 1) \div (x + 1)$	**Practice Exercises** 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 $x = 2$	**Practice Exercises** Use the factor theorem to determine whether the binomial is a factor of the given polynomial. 1. $(x + 3); P(x) = 2x^3 + 11x^2 + 16x + 6$ 2. $(x + 1); P(x) = 2x^3 + 5x^2 + 4x + 1$ 3. $(x - 2); P(x) = 4x^3 - 11x^2 + 8x - 4$ 4. $(x+3); P(x) = x^4 + 3x^3 - 2x^2 - 5x + 3$ 5. $(2x - 1); P(x) = 2x^3 - 7x^2 + x + 1$

D. Discussing New Concepts and Practicing New Skills #2		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. $F(x) = \dfrac{2x - 5x^5 + 7x}{3}$	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**
	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. $h(x) = \frac{}{\sqrt{x^7 + 3x^6 - 4x}}$ 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 $x = 5$	Use the factor theorem to determine whether the binomial is a factor of the given polynomial. 1. $(x - 2); P(x) = x^{20} - 4x^{18} + 3x - 6$ 2. $(x - 4); P(x) = 3x^3 - 15x^2 + 10x + 8$ 3. $(x+2); P(x) = x^4 - 3x^3 + 5x - 2$ 4. $(x - 2); P(x) = 3x^4 - 6x^3 + 5x + 10$ 5. $(x+5); P(x) = x^3 + x^2 - 25x + 25$

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 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 functions? 2. How can you apply your knowledge of polynomial functions 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 the remainder theorem? 2. How can you apply your knowledge of remainder theorem 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 factor theorem? 2. How can you apply your knowledge of factor 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 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 functions?	Let the students answer the following questions: 1. In your own words, what is 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 the remainder theorem? 2. How do we solve problems involving remainder theorem?	Let the students answer the following questions: 1. In your own words, what is the factor theorem? 2. How do we solve problems involving factor 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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