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 24, November 11 – 15, 2019	Quarter	3rd

I. OBJECTIVES	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Learning Competencies/ Objectives:	1. Define the factorial notation; 2. Find the factorial notation to determine whether a binomial is a factor of a given polynomial; and, 3. Demonstrate perseverance and willingness in solving problems.	1. Distinguish the fundamental principle of counting; 2. Calculate the fundamental principle of counting to determine whether a binomial is a factor of a given polynomial; and, 3. Project enjoyment and willingness in solving problems.	1. Illustrate the permutation; 2. Compute the permutation to determine whether a binomial is a factor of a given polynomial; and, 3. Exhibit enjoyment and self-reliance in solving problems.	1. Describe the distinguishable permutation; 2. Compute the distinguishable permutation to determine whether a binomial is a factor of a given polynomial; and, 3. Display enjoyment and interest in solving problems.	1. Illustrate the circular permutations; 2. Calculate the circular permutations to determine whether a binomial is a factor of a given polynomial; and, 3. Demonstrate self-reliance and independence in solving problems.
II. CONTENT	**PATTERNS AND ALGEBRA**				
	Factorial Notation	**Fundamental Principle of Counting**	**Permutation**	**Distinguishable Permutation**	**Circular Permutations**
III. LEARNING RESOURCES					
A. References					
1. Teacher's Guide Pages	pp. 290–296	pp. 297–304	pp. 305–310	pp. 311–318	pp. 319–324
2. Learner's Materials Pages	pp. 275–281	pp. 282–289	pp. 290–295	pp. 296–303	pp. 304–309
3. Textbook Pages	pp. 303–309	pp. 310–317	pp. 318–323	pp. 324–331	pp. 332–337
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	**Factorial Notation** n-Factorial: the product of the positive integer n and all the positive integers less than n. For any natural number n, $$n!\ n(n-1)(n-2)\ldots(3)\cdot(2)\cdot(1).$$ For the number 0, $$0!\ 1.$$	**The Fundamental Principle of Counting** Fundamental Principle of Counting: If one thing can occur in m ways and a second thing can occur in n ways, and a third thing can occur in p ways, and so on, then the sequence of things can occur in $m \times n \times p \times \ldots$ ways.	**Permutation** Permutations: the different possible arrangements of a set of objects.	
The number of permutations of n objects taken r at a time is: $$P(n,r)\ \frac{n!}{(n-r)!},\ n \geq r.$$ If $n\ \ r$, then $$P(n,r)\ n!$$	**Distinguishable Permutation** Distinguishable Permutations: the permutations of a set of objects where some of them are alike The number of distinguishable permutations of n objects when p are alike, q are alike, s are alike, and so on, is given by $$P\ \frac{n!}{p!q!r!}$$	**Circular Permutations** Circular Permutations: a special case of permutation where the arrangement of things is in a circular pattern The number of circular permutations of n different things is: $$(n-1)!\ (n-1)(n-2)\cdots(2)(1)$$ The number of permutations of n different things around a key ring and the like is: $$\frac{(n-1)!}{2}\ \frac{(n-1)(n-2)\ldots(2)(1)}{2}$$		

B. Establishing a Purpose for the Lesson	The purpose of this lesson is to enable the students to solve real life problems involving the factorial notation.	The purpose of this lesson is to enable the students to solve real life problems involving the fundamental principle of counting.	The purpose of this lesson is to enable the students to solve real life problems involving the permutation.	The purpose of this lesson is to enable the students to solve real life problems involving the distinguishable permutation.	The purpose of this lesson is to enable the students to solve real life problems involving the circular permutations.

C. Discussing New Concepts and Practicing New Skills #1	**Practice Exercises**	**Practice Exercises**	**Practice Exercises**	**Practice Exercises**	**Practice Exercises**
	A. Evaluate. 1. $6!$ 2. $4!\,5!$ 3. $\frac{9!}{4!} - 5!$ 4. $7! -$ 5. $\frac{6!}{4!3!}$ B. Simplify by factorization. 1. $\frac{7!-6!}{6}$ 2. $\frac{7!-6!}{6!}$ 3. $\frac{6!\,4!}{31}$ 4. $\frac{8!-6!}{55}$ 5. $\frac{7!\,6!-5!}{5!}$	Find the number of possible outcomes for each scenario using the fundamental counting principle. 1. Boys and girls in a family with two children. 2. Choosing a cellphone that comes in black, white, or transparent that is 3G or 4G. 3. A choice of muffin or toast bread with coffee, milk, or juice. 4. Basketball uniform in white, red, blue, yellow, or green which comes in sizes small, medium, or large. 5. A die is rolled thrice.	Solve each permutation problem completely. 1. A teacher wants to assign 4 different tasks to her 4 students. In how many possible ways can she do it? 2. In a certain general assembly, three major prizes are at stake. In how many ways can the first, second, and third prizes be drawn from a box containing 120 names? 3. In how many different ways can 5 bicycles be parked if there are 7 available parking spaces? 4. There are 8 basketball teams competing for the top 4 standings in order to move up to the semi-finals. Find the number of possible rankings of the four top teams. 5. In how many different ways can 12 people occupy the 12 seats in a front row of a mini-theater?	A. Find the number of distinguishable permutations for the following. 1. ALAPAAP 2. MAGSASAKA 3. HIMPAPAWID 4. BALAYAN 5. BINIBINI	Solve each problem completely. 1. In how many ways can 10 different colored toy horses be arranged in a merry-go-round? 2. In how many ways can 9 people be seated at a round table? 3. In how many ways can nine different colored beads be arranged on a bracelet? 4. In how many ways can eight keys be arranged on a key ring? 5. Snow white arranges the seven dwarfs around a maypole. a. In how many ways can she arrange them? b. In how many ways can she do it if Doc and Sleepy are to be together? c. In how many ways can she do it if Grumpy and Dopey must not be together?

D. Discussing New Concepts and Practicing New Skills #2	C. Simplify the following. 1. $\frac{n!}{n}$ 2. $\frac{(n\ 1)!}{n!}$ 3. $\frac{(n\ 2)!}{n!}$ 4. $\frac{(n\ 1)!}{(n-1)!}$ 5. $\frac{(n\ 1)!\ n! - (n-1)!}{(n-1)!}$			B. Find the number of distinguishable permutations for each situation. 1. In how many ways can two blue marbles and four red marbles be arranged in a row? 2. In how many different ways can five red balls, two white balls, and seven blue balls be arranged in a row? 3. Faith bought four vanilla ice-cream cones, three chocolate cones, two strawberry cones, and five ube-langka cones for her 14 tutors. In how many ways can she distribute the cones among her tutors?	

E. Developing Mastery	**Problem Set**	**Problem Set**	**Problem Set**	**Problem Set**	**Problem Set**
	A. Evaluate. 1. $7!$ 2. $3!\,5!$ 3. $8! - 3!$ $6!$ 4. $9! -$ 5. $\frac{8!}{5!4!}$ B. Simplify by factorization. 1. $\frac{6! - 5!}{5}$ 2. $\frac{8! - 7!}{7!}$ 3. $\frac{7!\,5!}{60}$ 4. $\frac{9! - 5!}{24}$ 5. $\frac{6!\,5! - 4!}{4!}$ C. Simplify the following. 1. $\frac{n!}{(n-1)!}$ 2. $\frac{(n-1)!}{n!}$ 3. $\frac{(n\ 2)!}{(n\ 1)!}$ 4. $\frac{(n-1)!}{(n\ 1)!}$ 5. $\frac{(n\ 1)! - n!\,(n-1)!}{(n-1)!}$	Find the number of possible outcomes for each scenario using the fundamental counting principle. 1. Clocks come in 2 styles: wall or desk. They come in 5 colors: white, black, red, blue, or orange. 2. Elias has a choice of a queen or king with a choice of hearts, diamonds, clubs, or spades. 3. A coin is tossed five times. 4. A coin is tossed and a die is rolled. 5. Notebooks come in 4 colors: red, yellow, green, and blue. They come in 2 types: 5-subject and 7-subject.	Solve each permutation problem completely. 1. How many 4-digit numbers can be formed from the digits 1, 3, 5, 6, 8, and 9 if no repetition is allowed? 2. If there are 10 people and only 6 chairs are available, in how many ways can they be seated? 3. In how many different ways can a president, vice president, a secretary, and a treasurer be chosen from a class of 15 students? 4. In how many different ways can a first, second, and third prizes be awarded in a game with eight contestants? 5. If four persons enter a bus on which there are ten vacant seats, how many ways can the four be seated?	A. Find the number of distinguishable permutations for the following. 1. PARALLEL 2. REPETITION 3. PHILIPPINES 4. GOOGOLPLEX 5. MISSISSIPPI B. Find the number of distinguishable permutations for each situation. 1. In how many ways can 4 green marbles and 6 blue marbles be arranged in a row? 2. How many distinguishable permutations are possible with all the letters of the word ELLIPSES? 3. Find the number of distinguishable permutations of the digits of the number 348,838.	Solve each problem completely. 1. In how many ways can five boys and three girls be arranged in a circle if the girls must always stand together? 2. Mother, father, and four children stand in a circle. In how many ways can they arrange themselves if mother and father stand opposite each other? 3. In how my ways can ten keys be arranged on a key ring? 4. If a spinner is divided in 7 equal parts, how many ways can you arrange 7 colors in it? 5. King Arthur arranges his 13 knights around a circular table. a. In how many ways can he arrange them? b. In how many ways can he do it if Galahad and Parcivale are to be seated together? c. In how many ways can he do it

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 factorial notation? 2. How can you apply your knowledge of factorial notation 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 fundamental principle of counting? 2. How can you apply your knowledge of fundamental principle of counting 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 permutation? 2. How can you apply your knowledge of permutation 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 distinguishable permutation? 2. How can you apply your knowledge of distinguishable permutation 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 circular permutations? 2. How can you apply your knowledge of circular permutations 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 the factorial notation? 2. How do we solve problems involving factorial notation?	Let the students answer the following questions: 1. In your own words, what is the fundamental principle of counting? 2. How do we solve problems involving fundamental principle of counting?	Let the students answer the following questions: 1. In your own words, what is the permutation? 2. How do we solve problems involving permutation?	Let the students answer the following questions: 1. In your own words, what is the distinguishable permutation? 2. How do we solve problems involving distinguishable permutation?	Let the students answer the following questions: 1. In your own words, what is the circular permutations? 2. How do we solve problems involving circular permutations?
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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