JANUARY

Makugihon

FEBRUARY

Mahigugmaon

MARCH

Matinabangon

APRIL

Matinahuron

MAY

Mahapsay og Malimpyo

JUNE

Maabtik og Musunod sa Insaktong Oras

JULY

Maantigo og Maabilidad

AUGUST

Maginhawahunon para sa Uban

SEPTEMBER

Madaginoton

OCTOBER

Matinud-anon

NOVEMBER

Masaligan

DECEMBER

Maalampuon

Republic of the Philippines
Department of Education
Regional Office IX, Zamboanga Peninsula

6

Zest for Progress
Zeal of Partnership

Mathematics
Quarter 3 – Module 2:
Formulating Rules; Expression or Equation

Name of Learner: ______________________________

Grade & Section: ______________________________

Name of School: ______________________________

What I Need to Know

The module contains one lesson:

Lesson 2: Formulating rules in finding Nth Term and Differentiating Expression from Equation.

After going through this module, you are expected to:

1. Formulate the rule in finding the **nth term** using different strategies (looking for a pattern, guessing and checking, working backwards)
2. Differentiate expression from equation

What I Know

Let us know of what you already know about this lesson

Directions: Supply the next three letters, figures, symbols, or combination of numbers and letters in the following patterns.

1. 2a,3b,4c,___,____,___
2. 2,4,6,8___,____,___
3. 5,7,9,___,____,___

4.z,y,x,w,z___,____,____

5. $z, z^3, z^5,$_____,_____,_____

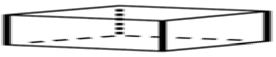
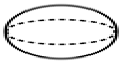
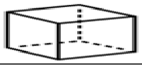
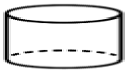
Directions: **Thumbs up** if the statement is true, **thumbs down** if the statement is false. Blacken the icons for your answer.

1. Expression is a phrase. 👍 👎
2. Equation is a sentence. 👍 👎
3. Equation has an equal sign. 👍 👎
4. Equation has two sides, left and right. 👍 👎
5. Expression has two sides, left and right. 👍 👎

What’s In

A plane figure is two-dimensional, and a solid figure is three-dimensional. The difference between plane and solid figures is in their dimensions. Where a square is a plane figure, its 3D counterpart, the cube, is a solid figure. The same comparison exists between a circle, or plane figure, and a sphere, a solid figure.

Directions: Complete the Table

Figure	Name of a Figure	Real object
1. 		Jewelry Box
2. 		
3. 	Cube	
4. 		
5. 		

What’s New

Poem with Scout and ESP Integration

Finding out Nth Term Rule

Finding out the Nth Term Rule so easy topic at school
We diligent scouters study about in all
And we will make sure, know the rule
So we have learnt the nth term rule

First, work out the difference and work it out again
Write down the number followed by an **N**
Then work backwards to find the exact **nth term**

Expression and Equation

Expression and equation with symbols and letters
Equations has two expressions, equal to each other.
Don’t be lazy, both get easier.
Coz we, diligent scouters

Expression of 2x-5, look for a signs to get a clue
Minus addition and multiplication that are true
Equation 2x-5=5, equals we have seen through
So scouters see the difference too.

What is it

Finding out the nth Term Rule

The nth Term of a Sequence

A sequence is a set of numbers written in a special order by the application of a definite rule. Each number in the sequence is called a **term.**

Example 1

Sequence	**Nth term Rule**	**Next Three terms**
a. 7, 10, 13, 16	3n+4 To get this nth term rule see the steps below	19, 22 , 25

To find Nth term Rule

Steps are follow:

Step 1: See the difference

7, 10, 13, 16

+3 **+3** **+3**

Every term after the first is obtained by adding 3, so write **3n**

Step 2: Multiply the counting numbers by 3 or shall we say multiples by 3

Counting numbers

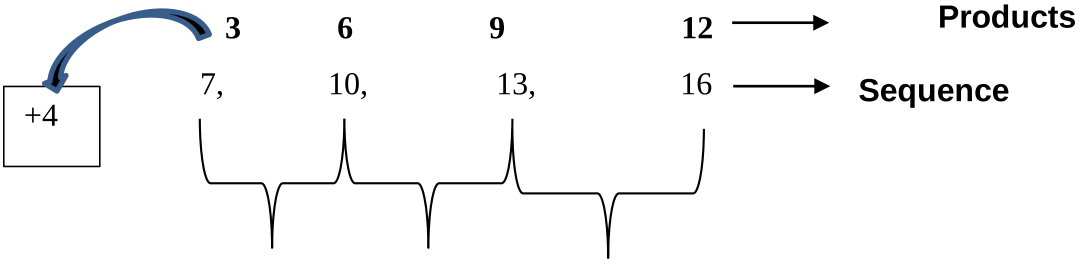
The set of numbers 1, 2, 3, 4, 5…..without (zero) is called counting numbers

3(1) = **3** 3(2) = **6** 3(3) = **9** 3(4) = **12**

Write all the products on the given sequence number

Step 3: Working backwards by subtracting the products from the given sequence

7-3=4



So write +4

Nth term Rule is 3n+4

You will notice the pattern, if all the products will be added **by 4** you can get the given sequence number.

3+4=**7** 6+4=**10** 9+4=**13** 12+4=**16**

To Check:

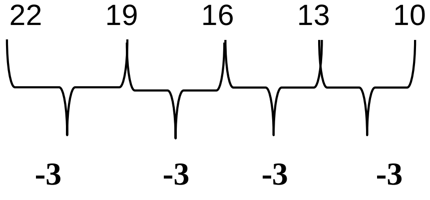
Substitute counting number to **N**
Since our **nth term rule is 3n+4**
Let **N** represents counting number
Counting Numbers 1,2,3,4 5 …..

3n + 4	3n + 4	3n + 4	3n + 4
3(1) + 4	3(2) + 4	3(3) +4	3(4) + 4
3 + 4 = **7**	6 + 4 = **10**	9 + 4 = **13**	12 + 4 = **16**

Example 2:

Sequence	**Nth term Rule**	**Next Three terms**
a. 22 19 16 13 10	-3n+25	7, 4, 1

Step 1: See the difference

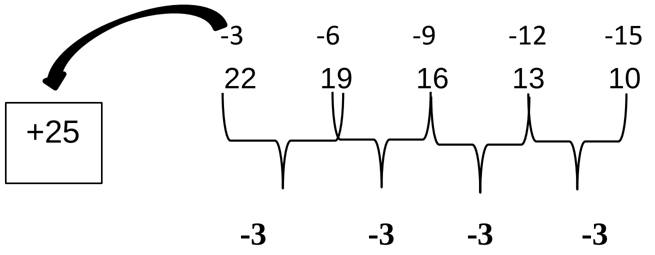


So write **-3n**

Step 2 Multiples of -3 **-3** **-6** **-9** **-12** **-15**

Step 3: Working backwards by subtracting the products from the given sequence

22-(-3) = 25



So write +25

Nth term Rule is -3n+25

Checking:

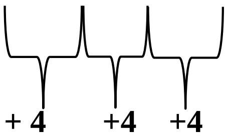
-3n+25	**-3n+25**	**-3n+25**	**-3n+25**	**-3n+25**
-3(1)+25	**-3(2)+25**	**-3(3)+25**	**-3(4)+25**	**-3(5)+25**
= 22	**=19**	**=16**	**=13**	**=15**

Example 3:

Sequence	Nth term Rule	Next Three terms
$\mathbf{\frac{1}{6}, \frac{1}{10}, \frac{1}{14}, \frac{1}{18},}$	$\frac{1}{4n+2}$	$\mathbf{\frac{1}{22}, \frac{1}{26}, \frac{1}{14}, \frac{1}{30},}$

Step 1: See the difference

$$\mathbf{\frac{1}{6}, \frac{1}{10}, \frac{1}{14}, \frac{1}{18},}$$



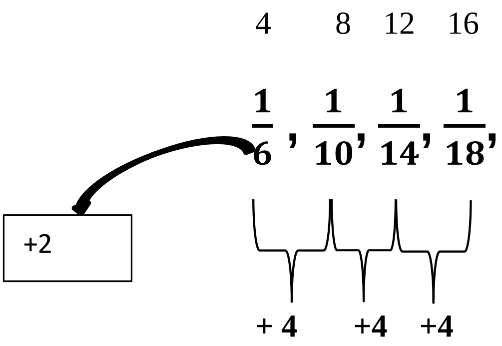
$$\mathbf{\frac{1}{4n}}$$

Step 2: Multiples of 4

4 8 12 16

Step 3: Working backwards by subtracting the products from the given sequence

6-4=2



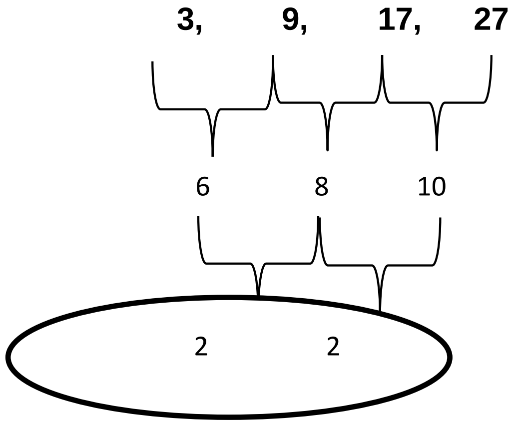
$$\frac{1}{4n+2}$$

This example we have no constant difference

Sequence	Nth term Rule	Next Three terms
3, 9, 17, 27	n^2+3n-1	39 53 69

Example 4

Step 1: See the **difference**



In this case we have 2nd difference write **n²**

Step 2: Divide the second difference by

$$\frac{2 \longrightarrow}{2 \longrightarrow}$$

From the difference

Constant

= 1

Write the quotient 1 before the $n^{2=}$ **1n²**

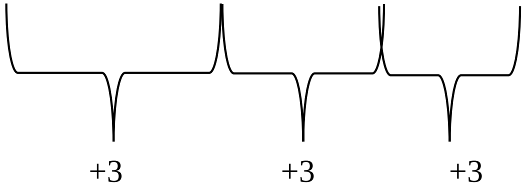
Assuming

If the second difference is 8 we can have $\frac{8}{2}$
=4

It becomes $4n^2$

Step 3
Draw a table

n	1	2	3	4
sequence	3	9	17	27
$1n^2$	$(1)^1=1$	$(2)^2=4$	$(3)^2=9$	$(4)^2=16$
Subtraction	3-1	9-4	17-9	27-16
	2	5	8	11



+3n

$$\boxed{\mathbf{1n^2+3n-1}}$$

-1 might be constant if we have this kind of example

Checking:

$1n^2+3n-1$	**$1n^2+3-1$**	**$1n^2+3n-1$**	**$1n^2+3n-1$**
$1(1)^2+3(1)-1$	**$1(2)^2+3(2)-1$**	**$1(3)^2+3(3)-1$**	**$1(4)^2+3(4)-1$**
1+3-1	**4+6-1**	**9+9-1**	**16 + 12 - 1**
= 3	**= 9**	**= 17**	**= 27**

Definitions:
A numerical expression is an expression that combines numbers and one or more operation symbols
A variable is any letter or symbol that represents a number.
A constant has a fixed value that does not change.
An algebraic expression is a mathematical phrase that used variables, numerals, and operation symbols.
An algebraic equation is a mathematical sentence with an equal sign (=) which shows that two expression on either side are equal.

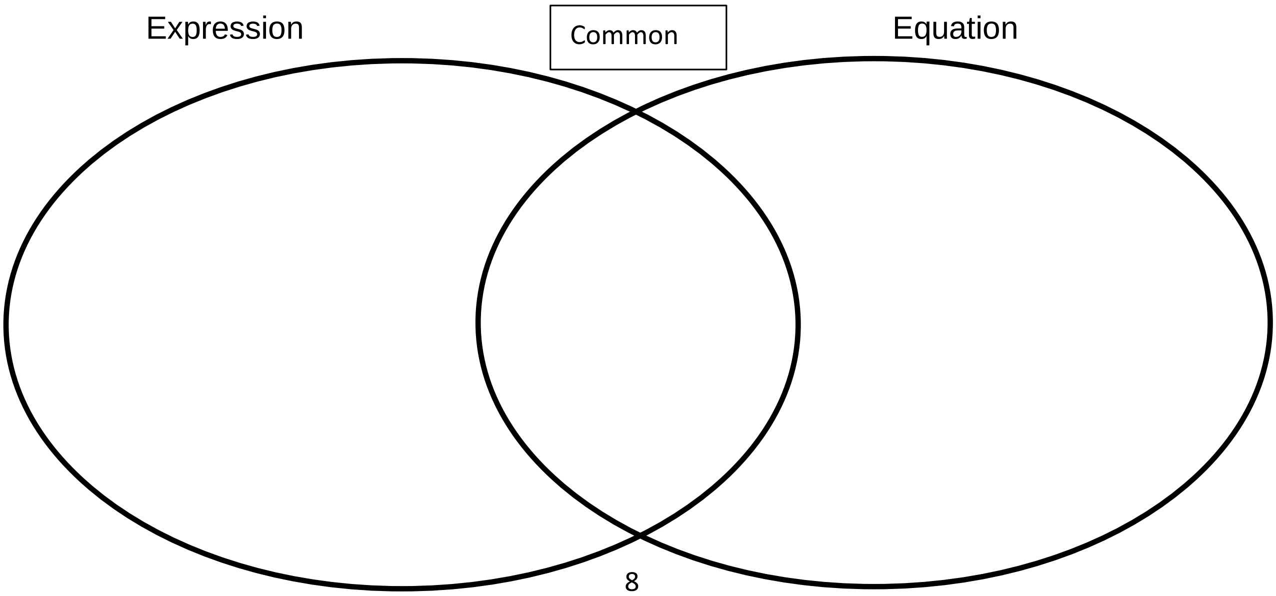
Differentiates Expression from Equation

Comparison Chart

BASIS FOR COMPARISON	EXPRESSION	EQUATION
Meaning	Expression is a mathematical phrase which combines, numbers, variables and operators to show the value of something.	An equation is a mathematical statement wherein two expressions are set equal to each other.
What is it?	A sentence fragment, that stands for a single numerical value.	A sentence that shows equality between two expressions.
Result	Simplification	Solution
Relation symbol	No	Yes, equal sign (=)
Sides	One sided	Two sided, left and right
Answer	Numerical value	Assertion, i.e. true or false.
Example	7x - 2(3x + 14)	7x - 5 = 19
	An expression is a PHRASE, a sentence fragment.	An equation is a SENTENCE.

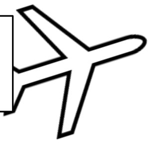
What's More

A. Directions: Differentiates expression from equation. Put your answer in the Venn diagram.

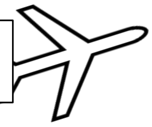


B. Directions: Find an expression by formulating the rule of the **nth term.** Connect each airplane to the clouds that corresponds to its correct answer.

1. 4,7,10,13,16



2. -6,-3,0,3,6,9



-5,-7,-9,-11-13

4. 10,15,20,25,30

5. 7,9,11,13,15

-2n-3

3n+1

3n-9

5n+5

2+n-5

2n+5

What I Have Learned

Directions: Fill in the blanks

1. What are the missing numbers in the sequence? $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, ____,_____,$\frac{7}{8}$

2. Complete the pattern 20,16,12,8 _____, _____, ______

For items 3-5

3. How many members in the 5th troop if the first troop has 8 members, the second troop has 10 members, and third troop has 12. __________

4. Which troop has 22 members? _______.
5. What is the common difference? _______

6. -10. Directions: Select your answer from the box

3k+7=34	3n+5	5m+2	2n-13=9	2n+5

Expression	Equation

What I Can Do

A. Directions: Formulate the rule in finding the nth term. Then find the next three terms in each sequence.

a. 3,5,7,9 _______, ______,______ Rule:______________________

b. $\frac{2}{3}, \frac{3}{4}, \frac{4}{5}$ _______,______,______ Rule:______________________

c. -2,-4,-6 _______,______,_____ Rule:______________________

d. 5,10,15,20 _______, ____, ____ Rule: _______________________

e. 3,6,9,12_________, ____, _____ Rule: _______________________

B. Directions: Give at least 3 examples of expression and 2 examples of equation.

Assessment

Directions: Read carefully and put your answer on the blank.

1. Carmi gets a starting salary of 13,000.00 a month and an increase of 500.00 annually. What will be her salary during the fifth year? ____________
Solutions:

2. Mrs. Torres increased her son's allowance who is studying in a university. She gave him 3,000.00 on the first month, 3,300.00 on the second month, 3600.00 on the third month and so on. How much will her son receive on the 7th month?
Solutions:

3. A pile of blocks has 40 blocks in the bottom row, 36 blocks in the second row, and 32blocks on the third row and so on until there are only 4 blocks on the top of row. How many blocks are there in the 7th row?
Solutions:

4.What is the 5th sequence if the nth term rule is 3n-9___________________?
Solutions:

5. Formulate the rule in finding the nth term of this sequence 40,36,32,30

Solutions:

1. Has a relation symbol ______________
2. Consist of two expressions___________
3. 10(5)-5(2) = 40 is an example of _______
4. A number less than five ____________
5. Ten equals five less than a number____

Additional Activities:

Find an expression for the nth term in the sequence -6, -3,2,9

References

Perez, Marjoseph H., Donnel P. Placer, Jaime R. Burgos. 21st Century MATHletes 6. edited by Mercurio T. Elenzano, EdD, Chin Uy, Ph.D..Quezon City.Vibal Group, Inc..2016

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