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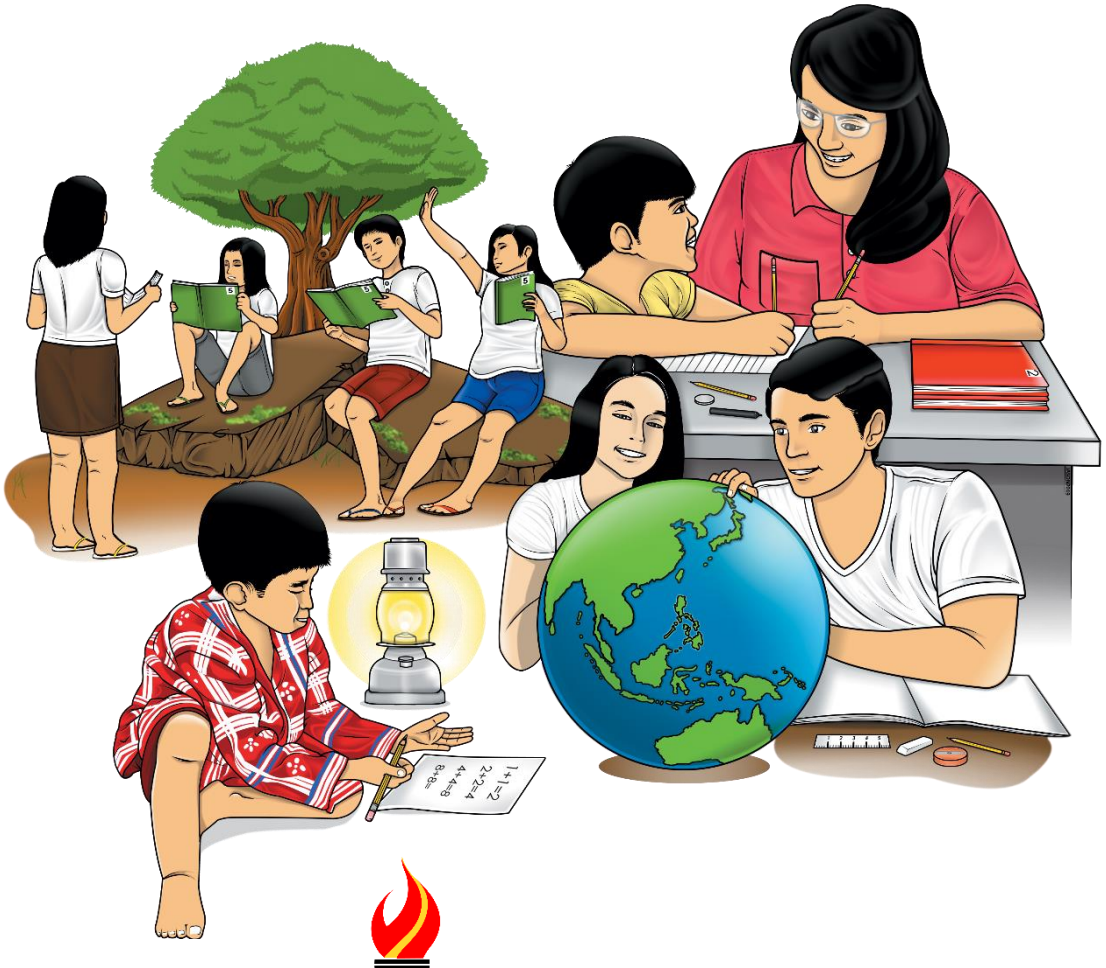
Mathematics

Quarter 1 – Module 1:

Sets



ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 7
Alternative Delivery Mode
Quarter 1 – Module 1: Sets
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Mathematics
Quarter 1 – Module 1:
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Introductory Message

For the facilitator:

Welcome to the (Mathematics 7) Alternative Delivery Mode (ADM) Module on (Sets) !

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to the Mathematics 7 Alternative Delivery Mode (ADM) Module on (Sets) !

The hand is one of the most symbolized parts of the human body. It is often used to depict skill, action and purpose. Through our hands we may learn, create and accomplish. Hence, the hand in this learning resource signifies that you as a learner is capable and empowered to successfully achieve the relevant competencies and skills at your own pace and time. Your academic success lies in your own hands!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:

 ***What I Need to Know***	This will give you an idea of the skills or competencies you are expected to learn in the module.
 ***What I Know***	This part includes an activity that aims to check what you already know about the lesson to take. If you get all the answers correct (100%), you may decide to skip this module.
 ***What's In***	This is a brief drill or review to help you link the current lesson with the previous one.
 ***What's New***	In this portion, the new lesson will be introduced to you in various ways such as a story, a song, a poem, a problem opener, an activity or a situation.
 ***What is It***	This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.
 ***What's More***	This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.
 ***What I Have Learned***	This includes questions or blank sentence/paragraph to be filled in to process what you learned from the lesson.
 ***What I Can Do***	This section provides an activity which will help you transfer your new knowledge or skill into real life situations or concerns.
 ***Assessment***	This is a task which aims to evaluate your level of mastery in achieving the learning competency.
 ***Additional Activities***	In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned. This also tends retention of learned concepts.
 ***Answer Key***	This contains answers to all activities in the module.

At the end of this module you will also find:

References	This is a list of all sources used in developing this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Do not forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!

What I Need to Know

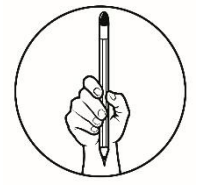
This module was designed and written with you in mind. It is here to help you master the Sets. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

The module contains lessons on:

- Lesson 1 – Sets
- Lesson 2 - Subset, Universal Sets, Null Set, Cardinality of Sets
- Lesson 3 – Union and Intersection of Sets and the Difference of Two Sets

After going through this module, you are expected to:

1. define a well-defined set;
2. illustrate a subset, universal set, null set, cardinality of set; and
3. analyze union, intersection, and the difference of two sets.



What I Know

Select the correct answer. Write the letter on a separate sheet of paper.

1. Which of the following is a well-defined set?
   a. A set of beautiful sceneries
   b. A set of good basketball players
   c. A set of Philippine Presidents
   d. A set of successful leaders.

2. List all the letters in the word “school”.
   a. {s, c, h, o, o, l} c. {s, h, o, o, l}
   b. {s, c, h, o, l} d. {s, c, o, l}

3. Which of the following is the symbol of an empty set?
   a. $\cap$ b. $\cup$ c. $\subseteq$ d. $\emptyset$

4. Which of the following is a subset of A= {1,2,3}?
   a. {0} b. {0,1} c. {1,2} d. {2,3,4}

5. Given the set of letters in the word “mathematics”, what is the cardinality of the given set?
   a. 11 b. 8 c. 6 d. 4

6. Which symbol is used to indicated the intersection of two sets?
   a. ∪ b. ∩ c. – d. ∅

7. Which symbol is used to indicated the union of two sets?
   a. ∅ b. ∪ c. ∩ d. –

*For numbers 8 – 10, use the following:
A = {1, 2, 4, 5, 6} B = {1, 3, 5, 7}, C = {2, 4, 6, 8}

8. Find A ∪ B
   a. {1, 2, 3, 4, 5, 6, 7}
   b. {1, 2, 3, 4, 5, 7, 8}
   c. {3}
   d. {1, 3, 4, 5, 7, 8}

9. Find B ∩ C
   a. {0, 2, 3}
   b. {0, 2, 3, 5, 6, 7, 8}
   c. { }
   d. {8}

10. Find A – B
   a. {1,2,4}
   b. {5,7,8}
   c. {3}
   d. {2, 4, 6}

11. The following is a subset of R = {n, e, w}, EXCEPT?
   a. {n, e, w} b. {e} c. {0} d. { }

12. Which of the following set has the cardinality equals to 5?
   a. Set A is the set of counting numbers less than 5.
   b. Set B is the set of letters in the word "RACER".
   c. Set C is the set of positive multiples of 5.
   d. Set D is the set of names of the fingers.

13. Given A = {i, c, e} and B = {c, o, l, d}, find A∪B.
   a. {c, o, l, d, i, e} b. {i, e} c. {e} d. { }

14. Given C = {5, 10, 15, 20} and B = {25}, find A ∩ B.
   a. {5, 10, 15, 20, 25} b. {5, 10, 15, 20} c. { } d. {0}

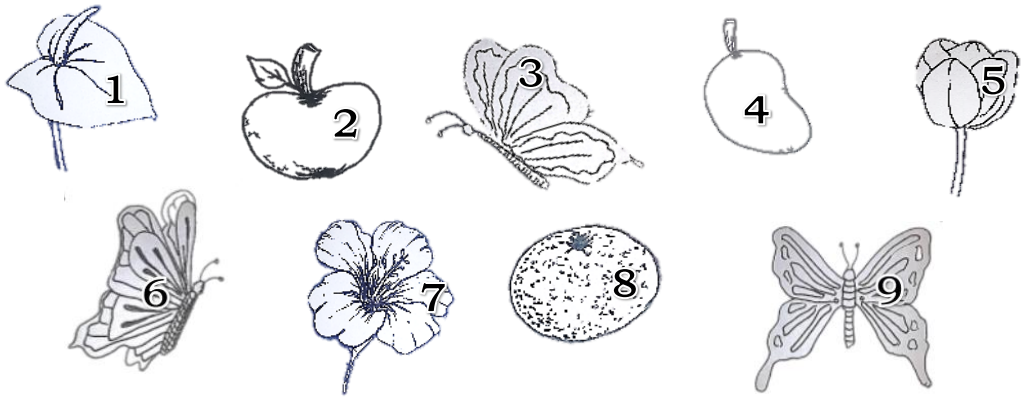
15. Given E = {pig, goat, cow, horse} and F = {chicken, duck}, find E – F.
   a. {pig, goat, cow, horse, chicken, duck}
   b. {pig, goat, cow, horse}
   c. {chicken, duck}
   d. { }

Lesson 1 Sets

In this lesson you will learn how to define and illustrate a well-defined set and to identify the elements of the given set.

What's In

Group and label the objects below according to their characteristics. Write your answer on a separate sheet of paper.



After you label and group the objects, answer the following questions:

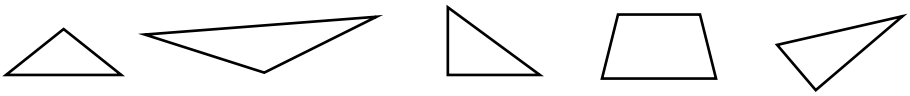
a. Why did you group the object as such?
b. How many groups are there?
c. What are the names of the groups created?

Notes to the Teacher

This activity will guide you to let the students describe and illustrate the set.

What's New

In the collections of objects below, which does not belong to the group?



What is It

Sets

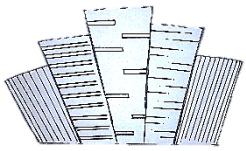
The groups are called sets. Set maybe thought as a collection of objects.

Example:

A set of mountains

A set of books

A set of buildings



WELL – DEFINED SET

In mathematics, **set** is a well-defined group or collection of objects that share common characteristics. The objects contained in the set are called **elements.**

A set can be named using capital letters like A, B, C, D,…Z and we use braces { } to group the elements of set separated by commas.

If a set contains many elements, we often use three dots, …, called **ellipsis**.

*Note: In listing the elements of the set, each distinct element is listed once and the order of the element does not matter.

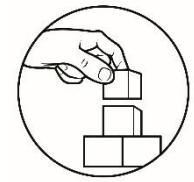
Example of well-defined sets

1. The set of primary colors
   M = $\{red, yellow, blue\}$
2. The set of all even numbers.
   E = $\{2,\ 4,\ 6, \ldots\}$
3. The set of all multiples of 5.
   Y = $\{5, 10, 15, \ldots\}$
4. The set of letter in the word "arrange".
   O = $\{a,\ r,\ n,\ g,\ e\}$

Example of not well-defined sets

1. The set of famous dancers.
2. The set of punctual students in your class.
3. The set of honest people

*Note: The sets given above are not well-defined since people will have different point of views on famous dancers, punctual students and honest people.



What's More

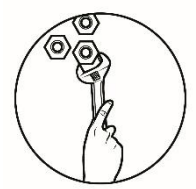
State whether each of the following sets is well-defined or not. Write your answer in the space provided before the number.

_____1. The set of young politicians.
_____2. The set of types of matter.
_____3. The set of versatile actress.
_____4. The set of all oceans of the earth.
_____5. The set of months containing 31 days.
_____6. The set of tasty food.
_____7. The set of planets in our solar system.
_____8. The set of durable bags.
_____9. The set of consonants in the English Alphabet
_____10. The set of even counting numbers.

What I Have Learned

Match the descriptions in column A with word/s being described in column B. Write the letter of your answer in the space provided

Column A	Column B
_____1. The objects contained in the set.	a. capital letters
_____2. A well-defined group or collection of objects that share common characteristics.	b. set
_____3. It is represented by three dots which is use to indicate that a set has many / infinite elements.	c. ellipsis
_____4. A symbol use to group the elements of a set.	d. { }
_____5. A symbol used in represent a set.	e. elements



What I Can Do

1. Which of the following is the set of animals living in water?
   a. A = {dolphin, whale, milk fish}
   b. B = {lion, buffalo, deer}
   c. C = {duck, chicken, turkey}
   d. D = {eagle, parrot, dove}

2. Given: A = {b, i, o, d, e, g, r, a, d, a, b, l, e}, which of the following is INCORRECT?
   a. It uses capital letter to name set.
   b. It does not list the object once.
   c. It uses braces.
   d. It uses commas.

3. The set of provinces in Region 12.
   a. E = {Aklan, Antique, Capiz, Guimaras, Ilo-ilo, Negros Occidental}
   b. F = {South Cotabato, North Cotabato, Sultan Kudarat, Sarangani, General Santos}
   c. G = {Ilocos Norte, Ilocos Sur, La Union, Pangasinan}
   d. H = {Cavite, Laguna, Batangas, Rizal, Quezon}

4. The set of months containing 30 days.
   a. I = {January, March, May}
   b. J = {February, April, June}
   c. K = {June, July, August}
   d. L = {June, September, November}

5. The set of secondary colors.
   a. M = {red, green, yellow}
   b. N = {brown, pink, blue}
   c. O = {green, orange, violet}
   d. P = {white, black, grey}

6. The set of vowels.
   a. Q = {a, e, i, o, u}
   b. R = {c, d, e, f, g}
   c. S = {h, i, j, k, l}
   d. T = {o, s, t, u, v}

7. Which of the following set is multiples of 2 and less than 12?
   a. U = {2, 10}
   b. V = {2, 4, 6}
   c. W = {2, 4, 6, 8}
   d. X = {2, 4, 6, 8, 10}

8. Which of the following is the set of odd whole numbers between 0 and 10?
   a. Y = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}
   b. Z = {0,2,4,6,8,9}
   c. A = {1,3,5,7,9}
   d. B = {1,3,5,7}

9. Name the next 3 elements of V = {3, 5, 7, 9, 11, ...}.
   a. {12, 13, 14}
   b. {12, 14, 16}
   c. {13, 14, 15}
   d. {13, 15, 17}

10. Name the next 5 elements of E = {2, 4, 6, ...}.
    a. {7, 8, 9, 10, 11}
    b. {7, 9, 11, 13, 15}
    c. {8, 9, 10, 11, 12}
    d. {8, 10, 12, 14, 16}

Lesson 2 Subsets, Universal Sets, Null Sets and Cardinality of Sets

In Lesson 1, you have learned how to illustrate sets. Now, you will learn about Subsets, Universal Sets, Null Sets and Cardinality of Sets.

What's In

MEMORY CHECK!

Identify whether each of the following sets is **well-defined** or **NOT**. Put a check mark (/) if it is well-defined and a cross mark (x) if it is not. Write your answer in the space provided before the number.

_____ 1. The set of all even numbers from 2 to 10.
_____ 2. The set of all factors of 18.
_____ 3. The set of responsible citizens.
_____ 4. The set of letters in the word "FATHER".
_____ 5. The set of hardworking front liners.

Notes to the Teacher

This activity will help the students recall the basic concepts of sets.

What's New

Given:

A = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

Find:

1. The set of odd numbers.
2. The set of all factors of 10.
3. The set of multiples of 4.
4. The set of negative integers.

What is It

UNIVERSAL SET

The universal set U is the set that contains all objects under consideration.
Examples:

1. Set U contains the set of whole numbers.
   U= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, …}

2. Set U contains the set of all letters of the English Alphabet.
   U = {a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z}

3. Set U contains the set of days of the week.
   U = {Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday}

SUBSETS

Given any two sets A and B, *if every element in A is also an element in B, then A is a* subset *of B*. The symbol "**A** ⊆ **B**" is read A is a *subset* of B.

*Note: Every set is a subset of itself and empty set is also a subset of every set.

Example:

1. R = {1, 2}

   The possible subsets are;

Two Elements	One Element	Zero Element
{1, 2}	{1}	{ } or ∅
	{2}	

2. O = {red, blue, yellow}

   The possible subsets of O are;

Three Elements	Two Elements	One Element	Zero Element
{red, blue, yellow }	{red, blue }	{ red }	{ } or ∅
	{red, yellow }	{ blue }	
	{ blue, yellow }	{ yellow }	

3. S = {3, 6, 9, 12}

The possible subsets of set S are;

Four Elements	Three Elements	Two Elements	One Element	Zero Element
{3, 6, 9, 12}	{3, 6, 9}	{3, 6}	{3}	{ } or ∅
	{3, 6, 12}	{3, 9}	{6}	
	{3, 9, 12}	{3, 12}	{9}	
	{6, 9, 12}	{6, 9}	{12}	
		{6, 12}		
		{9, 12}		

4. E = {m, a, t, h}

The possible subsets of set S are;

Four Elements	Three Elements	Two Elements	One Element	Zero Element
{m, a, t, h}	{m, a, t}	{m, a}	{m}	{ } or ∅
	{m, a, h}	{m, t}	{a}	
	{m, t, h}	{m, h}	{t}	
	{a, t, h}	{a, t}	{h}	
		{a, h}		
		{t, h}		

5. G = {0, 2, 4, 6, 8}

The possible subsets of set G are;

Five Elements	Four Elements	Three Elements	Two Elements	One Element	Zero Element
{0, 2, 4, 6, 8}	{0, 2, 4, 6}	{0, 2, 4}	{0, 2}	{0}	{ } or ∅
	{0, 2, 4, 8}	{0, 2, 6}	{0, 4}	{2}	
	{0, 2, 6, 8}	{0, 2, 8}	{0, 6}	{4}	
	{0, 4, 6, 8}	{0, 4, 6}	{0, 8}	{6}	
	{2, 4, 6, 8}	{0, 4, 8}	{2, 4}	{8}	
		{0, 6, 8}	{2, 6}		
		{2, 4, 6}	{2, 8}		
		{2, 4, 8}	{4, 6}		
		{2, 6, 8}	{4, 8}		
		{4, 6, 8}	{6, 8}		

NULL SET

A set with no element is an *empty set* or *null set*. The symbol for empty set is { } or ∅.

Example:

1. Set T is the set of counting numbers between 1 and 2.
   T = { } or T = ∅

2. Set I is the set of months with 35 days.
   I = { } or I = ∅

3. Set M is the set of cars with 60 doors.
   M = { } or M = ∅

4. Set B is the set of flying castles.
   B = { } or B = ∅

5. Set E is the set of crying trees.
   E = { } or E = ∅

CARDINALITY OF SETS

The cardinal number of set A, denoted by n(A), is the number of elements in set A. Thus, in A = $\{1, 3, 5, 7\}$, n(A) = 4 because set A contains 4 elements.

Examples:

Find the cardinality of the following sets.

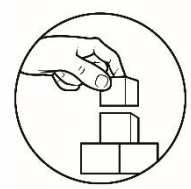
1. Set D is the set of vowels in English alphabet.
   Solution: D = $\{a, e, i, o, u\}$
   Answer: n(D) = **5**

2. Set R is the set of letters in the word "difficulty".
   Solution: R = $\{d, i, f, c, u, l, t, y\}$
   Answer: n(R) = **8**

3. Set M is the set of odd numbers between 1 and 3.
   Solution: M = { } or M = ∅
   Answer: n(M) = **0**

4. Set E is the set of letters in the word "survivor".
   Solution: E = $\{s, u, r, v, i, o\}$
   Answer: n(E) = **6**

5. Set K is the set of counting numbers less than 5.
   Solution: K = $\{1.2.3.4\}$
   Answer: n(K) = **4**



What's More

I. Find the cardinality of the following sets.

_____1. Set A is the set of days in a week.
_____2. Set B is the set of letters in the word "recognition".
_____3. Set C is the set of even numbers less than 2.
_____4. Set D is the set of odd numbers between 3 and 9.
_____5. Set E is the set of factors of 12.

II. Tell whether each statement is <u>True</u> or <u>False</u>.

_____1. $\{3, 5, 7\} \subseteq \{1, 2, 3, \ldots\}$
_____2. $\{b, h, r, q\} \subseteq \{h, r\}$
_____3. $\{3, 12, 5, 19\} \subseteq \{19, 3, 5, 12\}$
_____4. $\{4\} \subseteq \{2, 4, 6, 10\}$
_____5. $\emptyset \subseteq \{1, 3, 5, 7\}$

What I Have Learned

To sum it up, let us complete the statements. Choose your answer from the box that best completes the statements below.

universal set	subset	cardinality of set
null set	{ } or $\emptyset$	union of set

1. A set with no element is an empty set or _____.

2. The number of elements in the set refers to _____.

3. The _____ U is the set that contains all objects under consideration.

4. If every element in A is also an element in B, then A is a _____ of B.

5. The symbol for empty set or null set is _____.

What I Can Do

I. TRUE or FALSE: Given the sets below, write **true** if the statement is correct and **false** if it is wrong. Write your answer in the space provided before the number.

$S = \{0, 1, 2, 3, 4, \ldots, 10\}$ V = {5, 10, 15, 20, 25}
O = {d, a, y} I = {r, o, s, e}
$L = \{3, 6, 9, 12\}$ N = {roots, stem, leaves, flowers, fruits }
G = {Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune}

_____ 1. The cardinality of Set G is 8.
_____ 2. {5, 15, 25} is a subset of Set V.
_____ 3. {8} is a subset of Set L.
_____ 4. The cardinality of Set O is 7.
_____ 5. The number of elements in Set N is 5.
_____ 6. {s, u, n} is a subset of Set G.
_____ 7. An empty set or { } is a subset of Set N.
_____ 8. The cardinality of Set I is 10.
_____ 9. {5, 6, 7, 8, 9} is a subset of Set S.
_____ 10. One of the subsets of Set N and Set G is a ∅.

II. IDENTIFICATION: Identify the cardinality and the subsets of the following sets. You can use extra sheet of paper in listing the subsets of the given set.

1. Set A = {1, 8}
   n(A) = _____ Subsets: _____
2. Set B = {sun, moon, stars}
   n(B) = _____ Subsets: _____
3. Set C = {g, l, a, d}
   n(C) = _____ Subsets: _____
4. Set D = {2, 4, 6, 8}
   n(D) = _____ Subsets: _____
5. Set E = {green, orange, purple}
   n(E) = _____ Subsets: _____

Lesson 3 Union and Intersection of Sets and the Difference of Two Sets

In Arithmetic, we have learned the four fundamental operations that help us combine numbers. In sets, we are going to learn union and intersection of sets and the difference of two sets.

What's In

Identify if each statement is true or false. Write your answer in the space provided.
Given: U= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

_____ 1. The universal set is {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}.
_____ 2. {2, 4, 6, 8, 10} is a subset of U.
_____ 3. {0, 10} is a subset of U.
_____ 4. Empty set { } is a subset of U.
_____ 5. The cardinality number of set U is 10.

Notes to the Teacher

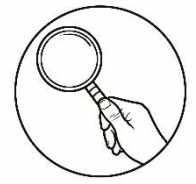
This activity will help the learners recall the concepts on Subsets, Universal Sets, Null Sets and Cardinality of Sets.

What's New

Select your answer/s from the words inside the box.

What animals can live on land? Name them.
What animals can live in water? Name them.
What animals can live both in land and water?

dog	cat fish
frog	milk fish
cow	turtle



What is It

OPERATION OF SETS

Name	Symbol	Definition
Union	∪	Is the set containing all elements that are in A or in B.
Intersection	∩	The set that consist of all elements that are both in A and B.
Difference	-	Is a set of elements in A that are not in B.

UNION OF SETS

The union of sets A and B, written as A ∪ B, is the set of elements that are members of A, or members of B, or members of both A and B.

Example:

1. If A = {1, 2, 3} and B = {1, 2, 4, 5, 6},
   then A ∪ B = {1, 2, 3, 4, 5, 6}

2. If A = {a, b, c, d, e} and B = {a, e, i, o, u},
   then A ∪ B = {a, b, c, d, e, i, o, u}

3. If A = {Monday, Tuesday, Wednesday, Thursday, Friday} and
   B = {Saturday, Sunday}, then A∪B = {Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday}

INTERSECTION OF SETS

The intersection of two sets A and B, written as A ∩ B, is the set of all elements common to both sets A and B.

Example:

1. If A = {1, 2, 3} and B = {1, 2, 4, 5, 6}, then A ∩ B = {1, 2}

2. If A = {a, b, c, d, e} and B = {a, e, i, o, u}, then A ∩ B = {a, e}

3. If A = {Monday, Tuesday, Wednesday, Thursday, Friday} and B = {Saturday, Sunday}, then A∩B = { } or ∅

DIFFERENCE OF TWO SETS

The difference of set A and B, written as A – B, is a set of elements in A that are not in B.

Example:

1. If A = {1, 2, 3} and B = {1, 2, 4, 5, 6}, then A – B = {3} while, B – A = {4, 5, 6}.

2. If A = {a, b, c, d, e} and B = {a, e, i, o, u}, then A – B = {b, c, d}, while B – A = {i, o, u}.

3. If A = {Monday, Tuesday, Wednesday, Thursday, Friday} and B = {Saturday, Sunday}, then A – B = {Monday, Tuesday, Wednesday, Thursday, Friday} while B – A = {Saturday, Sunday}.

What's More

I. Perform the following operations on sets.

Given:

A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
B = {2, 4, 6, 8, 10}
C = {1, 3, 5, 7, 9}

1. A ∩ C = _____
2. B ∩ C = _____

3. A ∩ B = _____
4. A ∪ B = _____
5. B ∪ C = _____
6. A ∪ C = _____
7. A – C = _____
8. B – C = _____
9. A – B = _____
10. C – A = _____

II. Answer the following:

Given:

Set X is the set of months in a year.
Set Y is the set of months that ends in "ber".
Set Z is the set of months that has 31 days.

Find:

1. X ∩ Y = _____
2. Z ∩ X = _____
3. Z ∪ Y = _____
4. Y ∪ Z = _____
5. X – Z = _____

What I Have Learned

Fill in the blank with the correct word or symbol to make the statement **TRUE**.

1. The _____ of sets A and B, written as A ∪ B, is the set of elements that are members of A, or members of B, or members of both A and B.

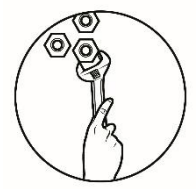
2. The _____ of two sets A and B, written as A ∩ B, is the set of all elements common to both sets A and B.

3. The _____ of set A and B, written as A – B, is a set of elements in A that are not in B.

4. If A = {m, a, t, h} and B= {a, m}, then _____= {a, m}.

5. If C = {English, Math, Science, Filipino, Values Education, TLE, Mapeh, Araling Panlipunan} and D = {Math, Science, English}, then _____ = {English, Math, Science, Filipino, Values Education, TLE, Mapeh, Araling Panlipunan}.

6. If O = {10, 20, 30, 40, 50} and P = {20, 40}, then _____= {10, 30, 50}



What I Can Do

Here is another activity that allows you to apply what you learned about the operations on sets. Write your answer in the space provided.

Here is another activity that allows you to apply what you learned about the operations on sets. Write your answer in the space provided.

1. If A = {a, b, c, d, e} and B = {a, c, f, g, h, i}, find:
   (a) A ∪ B = _____
   (b) A ∩ B = _____
   (c) A – B = _____

2. If A = {2, 3, 4, 5}, B = {4, 5, 6, 7}, and C = {6, 7, 8, 9}, find:
   (a) A ∪ B = _____
   (b) B ∩ C = _____
   (c) C – A = _____

3. If A = {4, 6, 8, 10, 12}, B = {8, 10, 12, 14}, C = {12, 14, 16} and D = {16, 18}, find:
   (a) B ∪ D = _____
   (b) A ∩ B = _____
   (c) A – B = _____

4. Let X = {ballpen, crayon, pentel pen, pencil}, Y = {pencil, ballpen}, Z = {crayon}
   Find:
   (a) X ∪ Y = _____
   (b) X ∩ Z = _____
   (c) X – Y = _____

5. Given: Set R is the set of letters between a to j.
   Set S is the set of vowels.
   Set T is the set of letters from a to e.
   Find:
   (a) R ∪ S = _____
   (b) S ∩ T = _____
   (c) T – S = _____

Assessment

Select the correct answer. Write the letter on a separate sheet of paper.

1. Which of the following is a well-defined set?
   a. A set of good writers
   b. A set of factors of 3.
   c. A set of honest students in grade seven
   d. A set small numbers

2. Which of the following is the symbol of a null set?
   a. U b. ∩ c. ⊆ d. ∅

3. Michelle listed the set of all letters in the word "serendipity" as shown below. What is wrong with this set?
   A = {s, e, r, e, n, d, i, p, i, t, y}
   a. It uses commas.
   b. It uses braces.
   c. The objects in this set are not listed once.
   d. A capital letter is used to represent this set.

4. Given the set of letters in the word "LOVE". What is the cardinality of the given set?
   a. 11 b. 8 c. 6 d. 4

5. What is the cardinality of {10, 20, 30, …, 80}?
   a. 8 b. 10 c. 12 d. 14

6. The following are subsets of U= {5, 10, 15, 20, 25, 30, 35, 40, 45, 50}, EXCEPT?
   a. {10, 20, 30, 50} c. {5, 10, 25}
   b. {5, 10, 15, 20, 25, 37, 40} d. { }

7. How many subsets does G = {t, e, a, m} have?
   a. 4 b. 12 c. 16 d. 20

8. Given A= {s, e, a, t} and B= {s, t, a, n, d}, find A∪B.
   a. {s, e, a, t, n, d} b. {s, a, t} c. {n, d} d. {e}

9. Given F = {o, r, a, n, g, e} and G = {y, e, l, o, w}, find F∩G.
   a. {o, r, a, n, g, e, y, l, w} c. {y, e, l, o, w}
   b. {o, r, a, n, g, e} d. {e, o}

10. Given X = {bus, jeepney, taxi, tricycle} and Y = {tricycle}, find the difference of Y and X.
    a. {bus, jeepney, taxi, tricycle} c. {tricycle}
    b. {bus, jeepney, taxi} d. { }

11. List all positive even numbers less than or equal to 10.
    a. {2, 4, 6, 8} c. {2, 4, 6, 8, 10}
    b. {1, 3, 5, 7} d. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

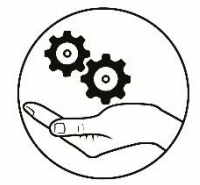
12. Which of the following is a subset of F = {c, a, n, d, y}?
    a. {c, a, n, d, y} b. {c, a, n, e} c. {0} d. {e}

    *For numbers 13 – 15, use the following:
    A = { 0, 1, 2, 3, 4 } B = { 3, 5, 7, 8 }, C = { 0, 2, 6, 8}

13. Find A ∪ B
    a. {0, 1, 2, 3, 4, 5, 6, 7, 8, 9} c. {3}
    b. {0, 1, 2, 3, 4, 5, 7, 8} d. {0, 1, 2, 3, 4,3, 5, 7, 8}

14. Find B ∩ C
    a. {0, 2, 3} b. {0, 2, 3, 6, 7, 8} c. {8} d. { }

15. Find A – C
    a. {0, 1, 2, 4} b. {1, 3, 4} c. {3} d. { }



Additional Activities

Activity 1.1 Give what is asked

Do the following exercises.

I. Tell whether each of the following sets is <u>well-defined</u> or <u>not</u>.
_____1. The set of admiring places.
_____2. The set of all counting numbers
_____3. The set of workaholic teachers.
_____4. The set of letters in the word “father”.
_____5. The set of all factors of 36.

II. Give the <u>cardinality</u> of the following sets.
_____1. The set of counting numbers from 5 to 25
_____2. The set of letters in the word “seven”
_____3. D = {1, 2, 3, 4, 5}

_____4. A = {m, o, d, u, l, e}
_____5. Y = {4, 8, 12, …, 36}

III. Let B = {2, 6}. List all the possible subsets of B.

IV. Answer the following. Write your answer in the space provided.

Given: If P = {1, 2, 3}, Q = {2, 3, 4}, R = {3, 4, 5}, and S = {4, 5, 6}

Find:

1. $P \cup Q$
2. $P \cup R$
3. $Q \cup R$
4. $Q \cup S$
5. $P \cap Q$
6. $P \cap R$
7. $S \cap P$
8. $Q - P$
9. $P - S$
10. $R - S$

Answer Key

Lesson 2:
What I Can Do

I.
1. true
2. true
3. false
4. false
5. true
6. false
7. true
8. false
9. true
10. true

II.
1. n(A) = 2
Subsets:
{ 1, 8 } , { 1 } , { 8 } , { } or ∅
2. n(B) = 3
Subsets:
{sun, moon, stars}
{sun, stars}
{sun, moon}
{moon, stars}
{sun}
{moon}
{stars}
{ } or ∅

Lesson 2:
What I Have Learned

1. null set
2. cardinality of set
3. universal set
4. subset
5. { } or ∅

Lesson 2:
What's More

I.	II.
1. n (A) = 7	1. True
2. n (B) = 8	2. False
3. n (C) = 1	3. True
4. n (D) = 2	4. True
5. n (E) = 6	5. True

Lesson 2:
What's In

Memory Check!

1. /
2. /
3. x
4. /
5. x

Lesson 1:
What I Can Do

1. a
2. b
3. b
4. d
5. c
6. a
7. d
8. c
9. d
10. d

Lesson 1:
What I Have Learned

1. e
2. b
3. c
4. d
5. a

Lesson 1:
What's More

1. not
2. well - defined
3. not
4. well - defined
5. well - defined
6. not
7. well - defined
8. not
9. well - defined
10. well - defined

What I Know

1. c
2. b
3. d
4. c
5. b
6. b
7. b
8. a
9. c
10. d
11. a
12. d
13. a
14. c
15. b

Lesson 3:
What's More

I.

1. {1, 3, 5, 7, 9}
2. { }
3. {2, 4, 6, 8, 10}
4. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
5. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
6. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
7. {2, 4, 6, 8, 10}
8. {2, 4, 5, 6, 8, 10}
9. {1, 3, 5, 7, 9}
10. { } or ∅

II.

1. {Sept, Oct, Nov, Dec}
2. {Jan, March, May, Jul, Aug, Oct, Dec}
3. {Jan, March, May, July, …, Dec}
4. {Jan, Feb, March, April, May, …, Dec}
5. {Feb, April, June, Sept, Nov}

Lesson 3:
What's In

1. true
2. true
3. false
4. true
5. true

What I Have Learned

1. union
2. intersection
3. difference
4. A ∩ B
5. C ∪ D
6. O – P

Lesson 2:
What I Can Do

3. n(C) = 4

Subsets:

{g, l, a, d} {g, l, a} {g, l} {g} { }
{g, l, d} {g, a} {l}
{l, a, d} {g, d} {a}
{g, a, d} {l, a} {d}
{l, d}
{a, d}

4. n(D) = 4

Subsets:

{2, 4, 6, 8} {2, 4, 6} {2, 4} {2} { }
{2, 4, 8 } {2, 6} {4}
{2, 6, 8} {2, 8} {6}
{4, 6, 8} {4, 6} {8}
{4, 8}
{6, 8}

5. n(E) = 3

Subsets:

{green, orange, violet} {green, orange} {green} { }
{green, violet} {orange}
{orange, violet} {violet}

Additional Activities

I.
1. not
2. well-defined
3. not
4. well-defined
5. well-defined

II.
1. 21
2. 4
3. 5
4. 6
5. 9

III.

{2,6}, {2}, {6}, {□}

IV.
1. {1,2,3,4}
2. {1,2,3,4,5}
3. {2,3,4,5}
4. {2,3,4,5,6}
5. {2,3}
6. {3}
7. {□}
8. {4}
9. {1,2,3}
10. {3}

Assessment

1. b
2. d
3. c
4. d
5. a
6. b
7. c
8. a
9. d
10. d
11. a
12. a
13. c
14. b

Lesson 3:
What I Can Do

1. **a.** {a, b, c, d, e, f, g, h, i} **b.** {a, c} **c.** {b, d, e}

2. **a.** {2, 3, 4, 5, 6, 7} **b.** {6, 7} **c.** {6, 7, 8, 9}

3. **a.** {8, 10, 12, 14, 16, 18} **b.** {8, 10, 12} **c.** {4, 6}

4. **a.** {ballpen, crayon, pentel, pen, pencil}
   b. {crayon}
   c. {crayon, pentel pen}

5. **a.** {a, b, c, d, e, f, g, h, i, o, u}
   b. {a, e}
   c. {b, c, d}

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