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Numbers and number phrases as a component contain concepts of numbers, properties, operations, estimates, and their applications. Measurement as a strand involves the use of numbers and measurements to describe, understand and compare mathematical and concrete objects. It focuses on attributes such as height, mass and weight, capacity, time, money and temperature, as well as applications related to perimeter, area, surface, volume and three-dimensional figures and their relationships, spatial visualization, reasoning and geometric modeling and evidence. Patterns and Algebra as a strand studies patterns, relationships and changes between shapes and amounts. It includes the use of algebraic notations, to represent and analyze relationships. Statistics and probability as part is all about developing skills in collecting and organizing data using charts, tables, and charts; understanding, analysing and interpreting data; dealing with uncertainty; and making predictions about the results. The K to 10 Mathematics Curriculum provides a solid foundation for mathematics at grades 11 to 12. More importantly, it provides necessary concepts and life skills required by Filipino students as they move on to the next stage in their lives as students and as citizens of the Philippines. Source: Department of Education We are always on the process of uploading GRADE 7 Teachers Guide. As requested, here are the file links. The remaining files will be uploaded soon. Check this section from time to time. Download these files for free. No Adfly. Virus-free. Safer. Available GRADE 7 Teachers Guide MAPEH 7 T.L.E 7 Share on Facebook Tweet Follow Us Share DepEd Tambayan offers a compiled list of Grade 7 7 Guide (TG) 2019 – 2020. DepEd Tambayan strives to provide free funds to our fellow teachers. These downloadable resources can help you and reduce your time in doing paperwork so that your efforts can be focused in the actual educational process. Mabuhay ang mga guro! What is K to 12 Teacher's Guide? The purpose of the K to 12 Teacher Guide is to help teachers prepare work units that integrate listening, speaking, reading, writing, and learning. Teacher's Guide helps teachers to think about important goals of the curriculum, as well as the opportunities children need to achieve the goals successfully. K-12 Teacher's Guide helps teachers expand their range of teaching techniques. In addition, it encourages teachers to think about the best conditions for the development of literacy. K-12 Teacher's Guide (TG) and Learner's Materials from the Learning Resources used in preparing daily lessons. Additional resources of literacy. K-12 Teacher's Guide (TG) and Learner's Materials, whether digital, multimedia or online, including those of teachers. However, these materials should be used by teachers as resources, not as the curriculum. Assessment is a continuous, scheduled process using various formation. It involves the processes of generating and collecting evidence of performance, evaluating this evidence, recording the findings and using this information to understand the development of the student and helping to improve the process of learning and teaching. The assessment for learning and teaching) and formal (assessment of learning). In both cases, regular feedback should be given to students to improve the learning experience. Download these Teacher's Guide (TG) 2019 – 2020 files for free. No Adfly. No pop-ups. Virus-free. Safer. Faster. Next Generation Learning StandardsCommon CoreTeacher/Leader EffectivenessVideo Library Professional Development LibraryVideo Professional Development SeriesProfessional Development Kits for Teacher TrainingProfessional Development Kits for Team Institutes Network Team Institute Institute Institutes Network Team Institutes January 17-19, 2012Network Team Institute: 8-10 February 2012Network Team Institute: 12-14 March 2012Network Team Institute: 12-13 Juli 2012Network Team Institute: 12-13 Juli 2012Network Team Institute: 12-14 March 2012Network Team Institute: 12-13 Juli 2012Network Team Institute: 12-14 March 2012Network Team Institute: 12-1 september 2012Network Team Institute: 10-11 oktober 2012Network Team Institute: 10-11 oktober 2012Network Team Institute: 26-29, 20122011 Network Team Institute: 26-2 Development SeriesProfessional Development Kits for Teacher TrainingProfessional Development Kits for Principal TrainingTraining Calendar for Network Team InstitutesNetwork Team InstitutesNetwork Team Institute: March 17-20 20152014 Network Team Institutes2013 Network Team Institutes2012 Network Team InstitutesNetwork Team Institute: January 17-19, 2012Network Team Institute: April 16-18, 2012Network Team Institute: April 16-18, 2012Network Team Institute: August 13-17, 2012Network Team Institute: April 16-18, 2012Network Team Institute: August 13-17, 2012Network Team Institute: April 16-18, 2012 2012Network Team Institute: September 12-13, 2012Network Team Institute: October 10-11, 2012Network Team Institute: November 26-29, 20122011 Network Team Institute: November 26-29, 201 this lesson, you are expected: 1. describe and illustrate a. well-defined sets; (b) subsets; (c) universal set; and d. the null set. 2. Use Venn charts to display sets and subsets. NOTE TO THE TEACHER: This lesson looks easy to teach, but don't be fooled. The introductory concepts are always crucial. What sets a set apart from each group is that a set is well defined. Emphasize this to the students. You vary the activity by indicating the students a different set of objects for the class or even making it into a game. The idea is that they create their own well-defined groups based on what they see as common characteristics of elements in a group. Lesson Right: A. I. Activity Below are some objects. Group them as they see fit and label each object belong to a group? c. Is there an object that belongs to more than one group? Which one? NOTE TO THE TEACHER: You have to follow the opening activity hence, the problem below is important. Ultimately, you want students to apply the concepts of sets as long as the objects in the group share a attribute and are therefore well defined. Problem: Consider the set consisting of whole numbers from 1 to 200. Let this be set U. Form smaller sets consisting of elements of You that share another attribute. For example, let E be the set of all even numbers from 1 to 200. Can you form three more sets like that? How many elements are there in each of these best of all even numbers from 1 to 200. Can you form three more sets like that? you thought of a set set no element? TEACHER NOTE: Below are important terms, notes, and symbols that students should remember. As of now, be consistent in your notes as well as not to confuse your students. Give numerous examples and non-examples. Important terms to remember The following are terms that you should remember from this point. 1. A set is a well-defined group of objects, called elements that have a common characteristic. For example, 3 of the above objects belong to the set of headgear or plain hats (ladies hat, baseball cap, helmet). 2. Set F is a subset of set A if all elements of F are also elements of A. For example, the even numbers 2, 4 and 12 all belong to the series of whole numbers. F is a good subset of A if F does not contain all elements of A. 3. The universal setU is the set that contains all the objects that are pending. 4. The null set is an empty set. The null set is a subset of a set. 5. The cardinality of set A is the number of elements in A. Notations and symbols In this section you will learn some of the notes and symbols related to collections. 1. Uppercase letters will be used to refer to each element of a set. For example, let H be the set of all objects on page 1 that cover or protect the head. We write H = {women's hat, baseball cap, helmet} 3. This is the list or grid method of naming the elements of a series is to use a descriptor. This is the line method. For example, H = {x | x covers and protects the head}. This is read as the set H contains the element x such that x covers and protects the head. 2. The symbol or {} is used to refer to an empty set. 3. If F is a good subset of A, then we write. 4. The cardinality of a set A is written as n(A). II. Questions to Pondering (Post-Activity Discussion) NOTE TO THE TEACHER: It is important for you to go over your students' answers to the questions asked in the opening activity to process what they have learned for themselves. Encourage discussions and exchanges in the classroom. Don't leave questions unanswered. Let's answer the questions in the opening activity. 1. How many sets are there? There is the set of headgear (hats), the set of polyhedra. But there is also a set of round objects and a set of polyhedra. But there is also a set of polyhedra All hats belong to the set of round objects. The pine trees and two of the polyhedra belong to the set of all first year students in this school The set of all girls in this class, 2. Name two subsets of the set of whole numbers using both the number or grid method;  $E = \{0, 2, 4, 6, 8, ...,\} O = \{1, 3, 5, 7, ...\} Rule method; E = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{1, 3, 5, 7, ...\} C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{1, 3, 5, 7, ...\} C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = \{2x \mid x \text{ is an integer}\} F A F A 4, 3, Let B = [1, 3, 5, 7, ...] C = [1, 3, 5, 7, ...] C$ possible subsets of B. {}, {1}, {3}, {5}, {7}, {9}, {1, 3}, {1, 5}, {1, 7}, {1, 9}, {3, 5, 7}, {9}, {1, 3, 5, 7}, {1, 3, 9}, {3, 5, 7}, {3, 5, 7}, {3, 5, 9}, {1, 5, 7}, {1, 3, 5, 7}, { Answer this guestion: How many subsets does a set of n elements have? There are 2n subsets in total. B. Venn Diagrams. Please note that in this lesson, you only introduce the use of these diagrams to display sets and subsets. The extensive use of the Venn Diagrams will be introduced in the next lesson, which is on set operations. The key is for students to be able to verbalize what they see depicted in the Venn Diagrams. Sets and subsets can be displayed with Venn charts. These are diagrams that use geometric shapes to show relationships between sets. Consider the Venn diagram below. Let the universal set you all elements are in the sets A, B, C and D. Each shape represents a set. Note that although no elements appear in any form, we can suspect or guess how the sets are related to each other. Note that set B is in set A. This indicates that all elements in B are included in A. The same goes for set C. Set D is, however, separate from A, B, C. What does it mean? Exercise Draw a Venn diagram to show the relationships between the following pairs or groups of sets: D A C 5. 1. E = {2, 4, 8, 16, 32} F = {2, 32} Sample answer 2. V is the set of all odd numbers W = {5, 15, 25, 35, 45, 55, ....} Example answer 3. R = {x x is a factor of 24} S = {} T = {7, 9, 11} Sample answer: NOTE TO THE TEACHER: End the lesson with a good summary. Summary In this lesson, you learned to use the Venn diagram to show relationships between collections. E F V W TR S 6. Lesson 2.1: Union and of sets Time: 1.5 hours Required concepts: Whole numbers, definition of sets, Venn diagrams Objectives: In this lesson is expected of you: 1. describe and define a. union of sets; (b) crossing of the sets. 3. Use Venn diagrams to represent the union and intersection of sets. Note to the teacher: Below are the opening activities for students. Emphasize to students that when counting the elements of a union of two sets of elements that are common in both sets. only one count is counted. Les Correct: I. Activities A B Answer the following questions: 1. Which of the following shows the association of A and B? 7. 1 2 3 2. Which of the following shows the intersection of set A and set B? How many elements are there at the intersection of A and B? 1 2 3 Here's another activity: Please V = { 2x | x, 1 x 4} W = {x2 | x, -2 x 2} What elements can be found in the association of V and W? How many are there? Remember how to use Venn Diagrams? Based on the diagram below, (1) determines the elements belonging to both A and B; (2) determine which elements belong to A or B or both. How many are in each set? 8. NOTE THE TEACHER: Below are important terms, notes, and symbols that students should remember. As of now, be consistent in your notes as well as not to confuse your students. Give numerous examples and non-examples. Important terms/symbols to remember The following are terms that you should remember from this point. 1. Allow A and B, referred to as A B, is the set containing the elements that are in A or B, or in both. An element x belongs to the association of sets A and B if and only if x belongs to A or x belongs to B. This tells us that A B = {x I x is in A or x is in B} Venn diagram: Note to the teacher: Explain to the students that in general, the inclusive OR is used in mathematics. So, as we say, elements belonging to A or B, includes the possibility that the elements belong to both. In some cases, both are explicitly mentioned when referring to the intersection of two sets. Advise students that from here, OR inclusive is used. 2. Allow A and B, indicated by A B, is the set with these elements in both A and B. An element x belongs to the intersection of sets A and B if and only if x belongs to A and x belongs to B. This tells us that A B = {x | x is in A and x is in B} U A B A B 10 0 1 1 2 25 3 6 A B 9. Venn diagram: Sets whose intersection is an empty set are called disjointed sets, 3. The cardinality of the association of two sets given by the following equation: n (A U B) = n (A) + n (B) - n (A \cap B). II. Ouestions to Pondering (Post-Activity Discussion) NOTE TO THE TEACHER It is important for you to go over your answers in the opening activities to process what they themselves have learned. Encourage discussions and exchanges in the classroom. Don't leave guestions unanswered. Below are the correct answers to the guestions asked in the activities. Let's answer the guestions in the opening activity. 1. Which of the following shows the association of set A and set B? Why? Set 3. This is because it contains all the elements that are in both A and B. There are 3 elements. In the second activity:  $V = \{ 2, 4, 6, 8 \}$  W =  $\{ 0, 1, 2, 4, 6, 8 \}$  has 6 elements. Please note that the element  $\{ 4 \}$  is counted only once. On the Venn diagram: (1) The set containing elements belonging to both A and B consists of two elements {1, 12}; (2) The set containing elements belonging to A or B or both consists of 6 elements {1, 10, 12, 20, 25, 36}. NOTE TO THE TEACHER: Always ask for the cardinality of the sets if it is possible to obtain such a number, if only to emphasize that n (A B)  $\neq$  n (A) + n (B) U A B 10. due to the possible intersection of the two sets. In the exercises below, use every opportunity to emphasize this. Discuss the answers and make sure students who play the guitar Set B Students who play the piano Ethan Molina Mayumi Torres Chris Clemente Janis Reves Angela Dominguez Chris Clemente Mayumi Torres Ethan Molina Joanna Molina Nathan Cruz Nathan Santos determine which of the following sets A and B? Set 1 Set 2 Set 3 Set 4 Ethan Molina Chris Clemente Angela Dominguez Mayumi Torres Joanna Cruz Mayumi Torres Ethan Molina Chris Clemente Mayumi Torres Janis Reves Chris Clemente Ethan Molina Nathan Santos Ethan Molina Chris Clemente Angela Dominguez Mayumi Torres Joanna Cruz Janis Reves Nathan Santos Ethan Molina Chris Clemente Angela Dominguez Mayumi Torres Joanna Cruz Janis Reves Nathan Santos Answers: (a) Set 4. There are 7 elements in this set. (b) set 2. There are 3 elements in this set. (c) set 2. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 3 elements in this set. (c) set 4. There are 5. There ar to the specified spaces:  $A = \{0, 1, 2, 3, 4\} B = \{0, 2, 4, 6, 8\} C = \{1, 3, 5, 7, 9\}$  Answers: Given the sets above, determine the elements and cardinality of: a.  $A B = \{0, 1, 2, 3, 4, 5, 7, 9\}$ ; n (A C) = 8 c.  $A B C = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$ ; n (A B C) = 10 d.  $A B = \{0, 2, 4\}$ ; n a B = 3 e.  $B C = \emptyset$ ; n (B C) = 0 f. A B C = Ø; n (A B C) = 0 g. (A B) C = {0, 1, 2, 3, 4, 5, 7, 9}; n (A B) C) = 8 11. NOTE TO THE TEACHER: In Exercise 2, you find the formula for the cardinality of the association of 3 sets is: n (A B(x) = n(A) + n(B) + n(C) - n(A B) - n(A C) elements of these sets. (a) (W Y) Z = {x | 0 & lt; x 4} (b) W Y Z = {x | 0 & lt; x & lt; 3} TEACHER NOTE: Finish with a good summary. Get more exercises on finding the union and the intersection of sets of numbers. Summary In this lesson you learned about the definition of association and the intersection of collections. You've also learned how to use Venn diagrams to represent the unions and the intersection of sets. 12. Lesson 2.2: Addition of a set time: 1.5 hours Of Pre-required concepts: collections, cardinality of sets, Venn diagrams About the lesson: The addition of a collection is an important concept. There will be times when one has to take into account the elements that are not found in a particular series; 3. Use venn diagrams to show the addition of a collection. WATCH THE TEACHER View the concept of the universal set before introducing this lesson. Emphasize to the students in the universal set that are not part of set A. Lesson Right: I. Problem In a population of 8 000 students, 2 100 are freshmen, 2 000 are sophomores, 2 050 are Juniors, and the remaining 1 850 are either in their fourth or fifth year in college. A student is selected from the 8 000 students and he/she is not a sophomore, how many possible choices are there? Discussion definition: The supplement of set A, written as A', is the set of all the elements found in the universal set, U, which are not found in set A. The cardinality n (A') is given by n (A') = n (U) – n (A). Examples: 1. Leave You =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$  and A =  $\{0, 2, 4, 6, 8\}$ . U A' A 13. Then the elements of A' are the elements from You that are not found in A. Therefore A' =  $\{1, 3, 5, 7, 9\}$  2. Leave =  $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$  and A =  $\{0, 1, 2, 3, 4, 5,$ 5},  $A = \{2, 4\}$  and  $B = \{1, 5\}$ . Dan  $A' = \{1, 3, 5\}$   $B' = \{2, 3, 4\}$   $A' B' = \{1, 2, 3, 4, 5\} = U$  3. Please Note =  $\{1, 2, 3, 4\}$  and  $B = \{3, 4, 7, 8\}$ . Dan  $A' = \{5, 6, 7, 8\}$   $B' = \{1, 2, 5, 6\}$   $A' B' \{5, 6\}$  4. Leave  $U = \{1, 3, 5, 7, 9\}$ ,  $A = \{1, 5, 7, 9\}$ . Then,  $A B = \{5, 7, 9\}$ . Then,  $A B = \{5, 7, 9\}$  (A B)' =  $\{1, 3, 5, 7, 9\}$ . Let yourself be the set of whole a set of whole set of whole a set of whole a set of whole a set of whole numbers. If  $A = \{x \mid x \text{ is a whole number and } x \& gt; 10\}$ , then  $A' = \{x \mid x \text{ is a whole number and } 0 \times 10\}$ . The opening asks for how many possible choices there are for a student who was selected and known as a non-Sophomore. Let You be the set of all students and n (U) = 8 000. Let A set all sophomores then n (A) = 2 000. Set A' consists of all students in You who are not sophomores and n (A') = n (U) – n (A) = 6 000. Therefore, there are 6000 possible choices for that selected students. The union is the universal series U. That is, A A' = U. Let them also remember that n (A A') = n (A) + n (A') = 0. Use Venn diagrams in the activity below to show how the different sets relate to each other, making it easier to identify unions and intersections of collections and additions of collections or additions or unions and intersections. Also pay attention to the language you use. In particular, (A B) is read as the association of the supplement of A and the supplement of B. II. Activity The table lists the names of high school students according to the definition of each set. A Like Singing B Like Dancing C Like Acting D Like Any Jasper Faith Jacky Miguel Joel Charmaine Leby Joel Jezryl Jasper Ben Joel Billy Ethan Camille Tina After the survey is completed, you will find the following sets: a. U = b. A B' = c. A' C = d. (B D) = e. A' B = f. A' D' = q. (B C)' = The easier way to find the elements of the specified sets, by using a Venn diagram with the relationships of You, sets A, B, C and D. Set D does not share a number of members. The venn diagram below is the correct picture: 15. A B C Joel Jacky Jasper Ben Leby Charmaine Jezryl Faith Miguel Billy Ethan Camille Tina U Now, it is easier to identify the elements of the required sets. a. U = {Ben, Billy, Camille, Joel, Jacky, Jasper, Ben, Billy, Ethan, Camille, Tina} c. A' C = {Jasper, Jacky, Joel, Ben, Leby, Charmaine, Jezryl, Joel, Jacky, Jasper, Jezryl, Joel, Jacky, Jasper, Ben, Billy, Camille, Charmaine, Jezryl, Joel, Leby, Miguel, Tina} b. A B' = {Faith, Miguel, Joel, Jacky, Jasper, Ben, Billy, Camille, Charmaine, Ethan, Faith, Jacky, Jasper, Ben, Billy, Ethan, Camille, Tina} b. A B' = {Faith, Miguel, Joel, Jacky, Jasper, Ben, Billy, Camille, Charmaine, Ethan, Faith, Jacky, Jasper, Ben, Billy, Camille, Charmaine, Ethan, Faith, Miguel, Tina} b. A B' = {Faith, Miguel, Joel, Jacky, Jasper, Ben, Billy, Camille, Charmaine, Ethan, Camille, Charmaine, Ethan, Camille, Charmaine, Ethan, Faith, Miguel, Tina} b. A B' = {Faith, Miguel, Joel, Jacky, Jasper, Ben, Billy, Camille, Charmaine, Ethan, Camille, Charmaine, E Billy, Ethan, Camille, Tina} d. (B D)' = {Faith, Miguel, Jacky, Jasper, Ben} e, A' B = {Leby, Charmaine, Jezryl, Ben} g, (B C)' = {Ben, Billy, Camille, Charmaine, Ben} g, (B C)' = {Ben, Billy, Camille, Charmaine, Ben} g, (B C)' = {Ben, Billy, Camille, Charmaine, Ben} g, (B C)' = {Ben, Billy, Camille, Charmaine, Ben} g, (B C)' = {Ben, Billy, Camille, Charmaine, Ben} g, (B C)' = {Ben, Billy, Camille, Charmaine, Ben} g, (B C)' = {Ben, Billy, Camille, Charmaine, Ben} g, (B C)' = discussions between students. Pay attention to the language they use. It is important that students correctly use the words or phrases If necessary, use Venn diagrams. III. Exercises 1. True or false, give the correct answer. Please = the set of the months of the year X = {March, May, June, July, October} Y = {January, June} Z = {September, October, November, December} 16. a. Z' = {January, February, April, August, September, November, November, November, C. X' Z' = {January, February, April, May, June, July, August, September, November} Where d. (Y Z)' = {February, March, April, May} False. (Y Z)' = {February, March, April, May, August}. NOTE THE TEACHER The next exercise is a great opportunity for you to develop student reasoning skills. If the supplement of A, the supplement of B and the supplement of C all contain the element a then a is outside all three sets, but within U. If B' and C' both b but A' contain, then A b. This kind of reasoning should be clear to students. 2. Place the elements in their respective sets in the diagram below based on the following elements assigned to each set: U A B C a b b g h i j 17. U = {a, b, c, d, e, f, g, h, i, j} A' = {a, c, d, e, g, j} B' = {a, b, c, f, h, h, i, j} NOTE TO THE TEACHER: In exercise 3 there are many possible answers, Invite students to show all their work. This is a good opportunity for them to explain their work. Help them decide which diagrams are correct. 3. Draw a Venn diagram to show the relationships between the U, X, Y, and Z sets, given the following information. Z You, the universal set contains some elements of X and the set Z May June June July x Y January December D February 18 August. NOTE THE TEACHER End with a good summary. Summary In this lesson you learned about the addition of a particular set. You have learned how to describe and define the addition of a set, and how it relates to the universal set, you and the given set. X Z Y U 19. Lesson 3: Problems with Sets Time: 1 hour Condition Concepts: Operations on sets and Venn Diagrams Objectives: In this lesson you are expected: 1. solving word problems with sets using Venn diagrams 2. apply set edits to solve a variety of word problems. NOTE THE TEACHER This is an important lesson. Don't skip it. This lesson reinforces what students have learned about sets, fixed operations, and the Venn diagram in problem solving. Lesson Right: I. Activity Try to solve the following problem: In a class of 40 students, 17 have driven a train and 4 have only driven a train and 4 have only driven a plane. Some students in class have not driven any of the three forms of transport and

an equal number have taken all three. A. How many students have used all three modes of transport? B. How many students have just taken the boat? WATCH THE TEACHER Ask students to write their own solutions. Let them discuss and discuss. Ultimately, you need to know how to send them to the right solution. II. Questions/Points to Think (Post-Activity Discussion) Venn diagrams can be used to solve word problems related to union and crossing sets. Here are some detailed examples: 1. A group of 25 high school students were asked if they use Facebook or Twitter or both. Fifteen of these students use Facebook, and 12 use Twitter. A. How many use Facebook only? B. How many use Twitter only 20. The Venn chart is shown below To find the elements in each region: The number of students who use Facebook only S2 = set of students who use Facebook only S2 = set of students who use Facebook only S2 = set of students who use Twitter only 20. The Venn chart is shown below To find the elements in each region: The number of elements in each region is shown below 2. A group of 50 students went on tour to Palawan. Of the 50 students, 24 joined the trip to Coron and Tubbataha Reef; 15 saw Tubbataha Reef; 15 saw Tubbataha Reef; 15 saw Tubbataha Reef; 15 saw Tubbataha Reef; 20 visited El Nido; 12 made a trip to Coron and El Nido; 12 made a trip to Coron; 18 went to Tubbataha Reef; 15 saw Tubbataha Reef; 15 saw Tubbataha Reef; 20 visited El Nido; 12 made a trip to Coron and El Nido; 12 made a trip to Coron and El Nido; 12 made a trip to Coron; 18 went to Tubbataha Reef; 20 visited El Nido; 12 made a trip to Coron; 18 went to Tubbataha Reef; 20 visited El Nido; 12 made a trip to Coron; 18 went to Tubbataha Reef; 20 visited El Nido; 12 made a trip to Coron; 18 went to Tubbataha Reef; 20 visited El Nido; 12 made a trip to Coron; 18 went to Tubbataha Reef; 20 visited El Nido; 12 made a trip to Coron; 18 went to Tubbataha Reef; 20 visited El Nido; 12 made a trip to Coron; 18 went to Tubbataha Reef; 20 visited El Nido; 20 spots. A. How many of the students went to Coron alone? B. How many of the students went to Tubbataha Reef alone? c. How many have only joined the El Nido trip? d. How many have only joined the El Nido trip? d. How many have only joined the El Nido trip? d. How many of the students went to Tubbataha Reef alone? c. How many have only joined the El Nido trip? d. How many have only joined the El Nido trip? d. How many have only joined the El Nido trip? d. How many have only joined the El Nido trip? those who visited Tubbataha Reef only n(S1) + n(S2) + n(S3) = 25 n(S) 1 + n(S2) = 15 n(S3) = 10 Maar n(S2) + n(S3) = 12 P4 = those who joined the El Nido trip only P5 = those who visited Coron and Tubbataha Reef only P6 = those who joined the Tubbataha Reef and El Nido travelonly P7 = those who saw Coron and El Nido only P8 = those who did not see any of the three tourist spots. N(P1) = 10. P1 P5 consists of students who visited Coron and Tubbataha Reef. but this set includes those who also went to El Nido. Therefore. n(P5) = 12 - 10 = 2 students who went to El Nido and Tubbataha Reef. but this set includes those who also went to El Nido. Therefore n(P6) = 15 - 10 = 5 students students Only El Nido and Tubbataha Reef. P1 P7 consists of students who went to Coron and El Nido, but this set includes those who also went to Tubbataha Reef. Therefore, n(P7) = 11 - 10 = 1 student only visited Coron. n(P3) = 18 - n(P1) - n(P5) - n(P6) = 18 - 10 - 2 - 5 = 1 student visited Tubbataha Reef only n(P4) = 20 - n(P1) - n(P6) - n(P7) = 20 - 10 - 5 - 1 = 4 students visited only Coron and El Nido. Therefore n(P8) = 50 - n(P1) - n(P3) - n(elements is shown below. Coron El Nido P8 Tubbataha Reef P5 P1 P6 P3 P2 P7 P4 22. What about the opening problem? Solution to the opening problem? Solution to the opening problem? Solution to the opening problem? and A 2. (a) If and are finite sets as well, what do you say about the cardinalities of the two sets? (b) If the cardinality of, does it follow? Answer: (a) ; b) No. Example: 3. If A and B have the same cardinality, does it follow that A = B? Explain. Answer: Not necessarily. Example, A = {1, 2, 3} and B = {4, 8, 9}. 4. Does it follow that? Illustrate your reasoning using a Venn diagram. Answer: Yes. 148 A B 3 4 21 4 4 T Coron El Nido 16 Tubbataha Reef 11 1 4 2 10 5 1 NOTE THE TEACHER Discuss the solution thoroughly and clarify any questions your students might have. Emphasize the notation for the cardinality of a collection. 23. 5. Among the 70 children in Barangay Magana, 53 as food in Jollibee, while 42 as food in McDonalds. How much do you eat in Jollibee and McDonalds? Alone in Jollibee and McDonalds? Alone in Jollibee and McDonalds only pull the Venn diagram Find the elements in each region n (M1) + n (M2) + n(M3) = 70 n(M1) + n(M2) = 5.3 n(M3) = 17 But n (M2) + n(M3) = 42 n(M1) = 28 Check with Venn diagram Jolli McBeeDonalds M1 M2 M3 A B C 24. 6. The following diagram shows how all first year students from Maningning High School go to school. A. How many students drive a car, jeep and MRT to go to school? 15 (b). How many students drive both in a car and in the MRT? 35 d. How many students in a car? 55 alone in a jeep? 76 in the MRT alone? 67 walk? 100 f. How many students of High school is there in total? 269 7. The blood type A. A person with antigen B has blood type B, and a person with both antigens A and B has blood type AB. If no antigen is present, the blood cells of some individuals was discovered in 1940. A person with this protein is classified as Rh positive (Rh+), and a person whose blood cells do not have this protein is Rh negative (Rh-). Sign a Walking 100 Jeep Car MRT Facebook Twitter 28 25 17 19 55 15 76 17 20 67 25. Venn diagram, and set edits to solve word problems. NOTE THE TEACHER The second problem is quite complex. Adding the 3rd set Rh captures the system without changing the original diagram in the first problem. A B Rh A+ A- B+ AB+ O+ B-AB- O- A BAB O 26. Lesson 4.1: Fundamental operations on integers: Addition of integers Time: 1 hour Pre-required concepts: Whole numbers, exponents, concept of integers objectives: In this lesson, you are expected: 1. add integers using different approaches; 2. solving word problems with the addition of integers. NOTE TO THE TEACHER This lesson is an overview and deepening of the concept of adding integers. Keep in mind that the definitions for integers operations must maintain the properties of the same operations on whole numbers. Here we present two models for addition that are used to represent addition of whole numbers. Lesson Correct: I. Activity Study the following examples: A. Addition with number 1. Use the number line to find the sum of 6 & amp; 5. On the number line, start with point 6 and count 5 units on the right. At what point 11; hence 6 + 5 = 11. 2. Find the sum of 7 and (-3). On the number line, start from 7 and count 3 units to the left, because the sign of 3 is negative. At what point does it stop? It stops at point 4; hence(-3) + (-3) + (-4) b. (-8) + (-8) + (-4) b. (-8) + the following generalization: Adding a positive integer to means that you are along the real line a distance of units to the left of . NOTE TO THE TEACHER OTHER can be used in this next activity. Autographed tiles can be algebra tiles or counters with different colors on each side. Bottle caps are easy to obtain and will be very good visual and hands-on materials. B. Addition With signed tiles this is another device that can be used to display integers. The tile represents integer 1, the tile stands for -1 and the flexible + - 0. Remember that a number and the negative cancel each other under the operation of the addition. This generally means, NOTE TO THE TEACHER Let students model the above equations with signed tiles or colored counters. Examples: 1.4 + 5 = 92.5 + (-3) + (-3) + (-3) + (-3) + (-1) + (-1) + (-1) +
(-1) + (11) = -16. 2. (6) + (-9) hence(6) + (-9) = -3. When coloured counters (discs) or bottle caps are used, one side of the counter indicates 'positive', while the other side indicates positive', while the other side indicates 'positive', while the other side of red to indicate negative. Examples: 1. The configurations below represent taking into account that a black disc and a white disc cancel each other, take pairs left. 29. This tells us that 2. Give a colored-counter representation of Therefore, The signed tiles model gives us a very useful procedure for adding large integers with different characters. Examples: 1. Since 63 is larger than 25, break 63 in 25 and 38. Hence 2. II. Questions/ Points to think using the above model, we summarize the procedure for adding integers as follows: 1. If the integers have the same character, simply add the positive equivalents of the integers and attach the common character to the result. a. 27 + 30 = + (/27/ + /30/) = (/57/) = + 57 b. (-20) + (-15) = - (/20/ + /15/+ (-20) Get the difference between 38 and 20: 18 Since 38 is greater than 20, the sign of the sum is positive. Hence b. Get the difference between 42 and 16: 26 Since 42 is greater than 10, the sum will have a negative sign. Hence b. Get the difference between 42 and 16: 26 Since 42 is greater than 10, the sum is positive. problem, the first step to do is to combine addends with the same boards and then of their sums. Examples: 1. III. Exercises A. Who was the first english mathematician to first use the modern symbol of equality in 1557? (To get the answer, calculate the sums of the exercises given below. Write the letter of the problem that matches the answer found in box at the bottom). A 25 + 95 C. (30) + (-20) R 65 + 75 B 38 + (-15) D. (110) + (-75) O (-120) + (-35) O 45 + (-20) T. (16) + (-35) O 45 + (-20) T. (16) + (-38) R (-65) + (-40) E 47 + 98 E (78) + (-15) E (-75) + (20) Answer: ROBERT RECORDE 31. B. Add the following: 1. (18) + (-11) + (3) 2. (-9) + (-19) + (-6) 3. (-4) + (25) A (-65) + (-40) E 47 + 98 E (78) + (-15) E (-75) + (20) Answer: ROBERT RECORDE 31. B. Add the following: 1. (18) + (-11) + (3) 2. (-9) + (-19) + (-6) 3. (-4) + (25) A (-15) E (-75) + (20) A (-15) E (-75) + (20 + (-15) 4. (50) + (-13) + (-12) 5. (-100) + (48) + (49) Answers: 1. 10 2. -34 3. 6 4. 25 5. -3 C. Solve the following problems: 1. Mrs Reves charged P3,752.00 of groceries on her credit card. Find her balance after she made a payment of P2,530.00. Answer: PhP1,222.00 2. In one game, Team Azcals lost 5 yards in a game but gained 7 yards in the next play. What was the team's actual yardage win? Answer: (-5) + 7 = 2 yards 3. A supplier got P50.00 on the first day; lost P28.00 on the first day; lost P28.00 on the second day, and got P49.00 on the first day; lost P28.00 on the bank account at the beginning of the month. He wrote cheques for PhP450, P1200 and PhP900. What was Ronnie's balance at the end of the month? Answer: 2 280 + (-450) + (-300) good to keep these models in mind, but make sure students learn to let go of these models and should be able to add integers using two different methods. The model of the number line is practical for small integers. For larger integers, the signed tile model is a more useful tool. 32. Lesson 4.2: Fundamental effect on integers. Subtracting integers Time: 1 hour Condition of integers over the lesson: This lesson focuses on subtracting integers using different approaches. It's an overview of what the students learned in grade 6. Objectives: In this lesson, you are expected to: 1. Subtract integers using a. number line b. signed tiles 2. problems with subtracting integers. NOTE TO THE TEACHER This lesson is a continuation of lesson 4.1 in a sense that mastering the law of characters alongside integers makes subtraction easy for students. Emphasis should be placed on the way in which the law of signs is also linked to that of Lesson Correct: I. Activity Study the material below. 1. Subtract as the reverse effect of addition. This means that when we ask what is 5 min 2?, we also ask what Do we add 2 to get 5? Using this definition of subtraction, we can deduce how subtraction is done using the number should be added to get 3? To get from 3 to 3, you need to move 7 units to the left. This is equivalent to adding to 3. Hence to get, it should be added to 3. Therefore, b. Compute 33. What number needs to be added to
get it? To get to, move 4 units to the right, or equivalent, add 4. Therefore 2. Subtraction is also defined as the addition of the negative soft each other, we can also have. Hence, the above examples can be resolved as follows: This definition of subtraction allows the conversion of a subtraction allows the conversion of a subtraction problem. WATCH THE TEACHER You should follow the opening activity, which is why the issue below is important to reinforce what has been discussed. Problem: Subtract (-45) from 39 using the two definitions of subtraction. Can you draw your number line? Where do you start numbering to shorten the line? Solution: 1. What number does it need to be added to to obtain 39? 34. 2. II. Questions/Points to Thought Rule in Subtracting integers When subtracting integers, add the negative of the subtrahend to the minuend, NOTE TO THE TEACHER Give more examples if necessary. The following section is based on the use of colored counters or signed tiles. Study the material so that you can guide your students in understanding the use of these tiles. Using signed tiles or colored counters Signed tiles or colored counters can also be used to model subtraction of integers. In this model, the concept of subtraction as removal is used. Examples: 1. means taking 6 out of 10. Hence 2. 35. 3. 4. Hence the last two examples above illustrate the definition of subtraction as the addition of the negative. Because there are not enough counters to remove 9, we add 9 black counters and 9 white counters. Remember that these added counters are equal to zero. We're taking away nine black counters now. This configuration is the addition and obtaining the answer 36. III. Exercices A. What is the name of the 4th highest mountain in the world? (Decrypt the answer by finding the difference of the following subtract problems. Write the letter to the one corresponding to the item in the box below: O Subtract (-33) from 99 L Subtract of 0 T How much is 0 reduced by (-11)? S (-42) – (-34) – (-3 Give the difference: 1. 53 - 25 6. 25 - 43 2. (-6) - 123 7. (-30) - (-20) 3. (-4) - (-9) 8. (-19) - 2 4. 6 - 15 9. 30 – (-9) 5. 16 - (-20) 10. 10. - (-15) C. Solve the following problems: 1. Maan deposited P53,400.00 into her account and withdrew P19,650.00 after a week. How much of her money was left in the bank? Answer: PhP33,750.00 2. Two trains start at the same station at the same time. Train A runs 92km/h, while train B runs 82km/h. If the two trains travel in opposite direction, how far apart will they be in two hours? Answer: 92 - (-82) = 174 km apart 2×92-2×82 = 20 km apart 3. During the Christmas period, the student gov't association was able to recruit 2 356 groceries and distribute 2 198 groceries to a barangay. If this group decides to distribute 2 198 groceries to the next barangay, how much more groceries do they need to ask? Answer: 2 356 - 2 198 = 158 left after the first barangay 1 201 - 158 = 1 043 needed for the second barangay Answers: 1. 28 2. -129 3. 5 4. -9 5. 36 6. -18 7. -10 8. -21 9. 39 10. -4 37. NOTE TO THE TEACHER Finally, emphasize the new concepts of subtraction and how these concepts can deduct the conversion of problems to addition problems. Summary In this lesson, you learned how to subtract integers by converting the process of addition and by converting subtraction of integers: Multiplication of integers Time: 1 hour Condition Concepts: Operations on whole numbers, addition and subtracting of integers About the lesson: This is the third lesson on integers operations. The purpose of the lesson is to deepen what students have learned in grade 6, by explaining the meaning of multiplication of integers. Objective: In this lesson; you are expected: 1. multiply integers 2. multiply integers when troubleshooting. NOTE TO THE TEACHER The repeated multiplication addition model can be extended to multiply two integers where one of the factors is positive. However, for products are negative, repeated addition has no meaning whatsoever. Hence, multiplication of whole numbers will be discussed in two parts: the first part looks at products with at least one positive factor, while the second study studies the product of two negative integers. Lesson correct: I. Activity Answer the following question. For example, that means three groups of four. Or, putting it in a real context, 3 with 4 passengers each, how many passengers in total? So, if there are 4 cars with 3 passengers each, in counting the total number of passengers, the comparison is. We can then say that and we extend this definition to multiplication of a negative whole whole a positive integer. Think of the situation where a boy loses P6 for 3 consecutive days. His total loss for three days is. That's why we can have 39. II. Questions/Points to Think The following examples further illustrate how integers are multiplied. Example 1. Multiply :  $5 \times (-2) = (-2) \times (5)$  Therefore:  $(-2) \times (5) = (-2) \times (-2) (-2) \times (-2) \times (-2) = (-2) \times (-2) \times$ multiplication is a negative integer. Generalization: Multiplying as opposed to signs We know that adding negative numbers means adding their positive integers and . We know that a whole number multiplied by 0 gives 0. Does this also apply to an integer? The answer is YES. In fact, each number multiplied by 0 0. This is known as the Zero Property. FOR THE TEACHER: PROOF OF THE ZERO PROPERTY Since 1, the identity for addition is 0, so a×1=a×(1+0)=a · According to the distribution law a×(1+0)=a×1+a×0=a. Hence a+a×0=a. Now 0 is the only number that doesn't change an on top. Therefore a×0=0. What do we get when we multiply two negative integers? Example 2. Multiply: (-8) × (-3) We know that. Therefore (Distributive Law) ( and its additive inverses) (Zero Property) The only number that indicates when added to 0 is the additive inverse of . Therefore, the additive is inverse of 24, or The result shows that the product of two negative integers is a positive integers. 40. NOTE THE TEACHER The above argument can be presented to obtain the product (-a)×(b). The evidence can be presented to more advanced students. It is important to note that the product's definition of two negative integers is not based on the same model as the whole-number product (i.e. repeated addition). The basis for the definition of the properties or axioms of whole numbers (distribution right, identity and reverse property). Generalization: Multiply two negative integers if and are positive integers, then . Rules in Multiplying Integers: In multiplying integers, find the product of their positive equivalents. 1. If the integers have different signs, their product is negative. III. Exercises A. The product of: 1. (-8) (4) 3. (-5) (3) (2) 4. (-7) (4) (-2) 5. (3) (8) (-2) 6. (9) (-8) (-9) 7. (-9) (-4) (-6) B. How can a person distribute 10 apples fairly between 8 children, so that each child has the same share? To resolve the numbers in column I. Column II 1. (6) (-12) C 270 2. (-13) (-13) P-72 3. (19) (-17) E 300 4. (-15) (29) K -323 5. words per minute, how many words can Mark type in 30 minutes? Answer: 1 350 words 3. Give a computational equation that will solve the next one. The messenger came and delivered 6 checks worth of PhP120 each. Are you richer or poorer? How many? c. The messenger came and delivered 12 accounts for PhP86 each. Are you richer or poorer? How many? d. The messenger came and took 15 notes for PhP72 each. Are you richer or poorer? How many? Answers: a. Richer by PhP300 b. Armer by PhP1,032 d. Richer by PhP1,080 NOTE TO THE TEACHER Give additional problems and exercises, if only to strengthen the rules for multiplying integers. Summarize by also highlighting the different types of problems in this lesson. Summary This lesson emphasized the meaning of multiplication to set the rules for multiplying integers. To multiply integers, you first find the product of their positive equivalents. If the integers have the same signs, their product is positive. If the integers have different signs, their product is negative. Answer: CREATE APPLE JUICE 5 4 3 7 4 1 1 9 7 8 2 10 6 7 Lesson 4.4: Fundamental Operations on
Integers: Division of Integers Time: 1 hour Condition Concepts: Addition and subtraction of integers, multiplication of integers 2. problems with the distribution of integers. NOTE THE TEACHER This is a short lesson because the drawing rules for the distribution of integers are the same as when integer multiplication. The distribution should be understood as the reverse effect of multiplication. So that the rules are the same with regard to the sign of the guotient. Lesson correct: I. Activity Answer the following questions: What is (-51) ÷ (-3)? What is 51 ÷ (-3)? the rules for dividing integers? II. Questions/Points to Think We have learned that subtraction is the reverse effect of Addition, Similarly, Division is the reverse effect of ignore the signs for the meantime, we know that we also know that in order to get a negative product, the factors must have different signs. Hence (-51) ÷ ÷ = 17 Example 2. What is Solution: Therefore NOTE THE TEACHER This exercise emphasizes the need to remember the drawing rules for dividing integers. 43. Example 3. Show why  $273 \div (-21) = -13$ . Solution:  $(-13) \times (-21) = 57$  Therefore,  $273 \div (-21) = -13$  NOTE THE TEACHER It is important to give more examples to students. Always ask students to explain or justify their answers. Generalization The guotient of two integers with the same characters is a positive integer, and the guotient of two integers that have as opposed to characters is a negative integer. However, distribution by zero is not possible. NOTE TO THE TEACHER Since we have introduced division, it is now easy to demonstrate why distribution per 0 is not possible. What is (-10) ÷ 0? Because distribution is the opposite of multiplication, we need to find a number such that when multiplied by 0 gives -10. But, there is no such number. In fact, no number can be divided by 0 for the same reason. When multiple operations 1. 2. 3. Solution: 1. 3. Exercises: A. Calculate the following 1. 2. 3. 4. 5. B. What was the original name for the butterfly? To find the answer, you can find the quotient of each of the following. Then write the letter of the problems in the box that corresponds to the quotient. Answers: 1. -12. -73 3. 26 4. -4 5. 8 44. Answers: 1. -12. -73 4. -4 5. 8 44. Answers: 1. -12. -73 4. -4 5. 8 44. Answers: 1. -12. -73 4. -4 5. 8 44. Answers: 1. -12. -73 4. -4 5. 8 4. -4 5. 8 4. -4 5. -4 5. 8 4. -4 5. -4 week, How much is her average earning in a day? Answer: PhP1,250.00 (8750 ÷ 7 = 1250) 2. Russ worked in a factory and earned 15 days P7,875.00. How much does he make in a day? Answer: PhP525.00 (7875 ÷ 15 = 525) 3. There are 336 oranges in 12 baskets. How many oranges are there in three baskets? Answer: 84 oranges (336 ÷ 12 × 3 = 84) 4. A teacher must distribute 280 pieces of grave paper equally among his 35 pupils. How many pieces of grave paper does each student get? Answer: 8 (280 ÷ 35 = 8) 5. A father has 976 square meters much; He has to distribute it to his four children. What is each child's share? Answer: 244 square meters (976 ÷ 4 = 244) D. Complete the three-by-three magic square (i.e., the sum of the numbers in each row, in each column and in each of the diagonals are the same) using the numbers -10, -7, -4, -3, 0, 3, 4, 7, 10. What is the sum for each row, column, and diagonal line? 9 37 -15 -8 -8 28 -16 12 -48 R (-352) ÷ 22 L(128) ÷ -16 (168) ÷ 6E(144) ÷ -3 (108) ÷ 9B (-315) ÷ (- 35) (-147) ÷ 7T F (-120) ÷ 8U T (-444) ÷ (-12) Y 45. Answer: The sum of all numbers is 0. That is why every a sum of . Put 0 in the middle square. Put each number and are negative on either side of 0. One possible solution is 7 10 3 – 4 0 4 – 3 – 10 – 7 Summary Division is the reverse operation of multiplication. Using this it is easy to see that the guotient of two integers with the same characters is a positive integer, and the guotient of two integers that have as opposed to characters is a negative integer. 46. Lesson 5: Properties of operations by integers Time: 1.5 hours Condition Concepts: Addition, subtracting, multiplying and dividing integer's objectives In this lesson you are expected to: 1. states and illustrates the different properties of the operations on integers a. closure d. distributive b. associative f. inverse f algebra, and one of the least mastered skills of students based on research. The various activities presented in this lesson will hopefully provide students with a tool for creating their own procedures in solving equations related to integers. These are the basic rules of our system of algebra and they will be used in all subsequent mathematics. It is very important that students understand how to apply each property when solving mathematical problems. In activities 1 and 2, try to test the students can show some creativity in activity 2. Lesson correct: I. A. Activity 1: Try to think about this . . . 1. Give at least 5 words synonymous with the word property. Activity 2: PICTIONARY GAME: DRAW AND TELL! 47. The following questions will be answered if you go along to the next activity. What properties of real numbers were shown in the Pictionary Game? Give an example and explain. How are these traits seen in real life? NOTE TO THE TEACHER Activity 3 gives a visual presentation of the property of real numbers is illustrated in the following images: A. Fill in the blanks with the correct numerical values of the motorcyclist and \_ If a represents the number of motorcyclists and b represents the number of cyclists, show the mathematical statement in the diagram below. \_\_\_\_\_+ \_\_\_ = \_\_\_\_+ \_\_\_ Expected answer: a + b = b + a guide question: What operation is used to illustrate the diagram? Adding What happened to the terms in both sides cyclists. of the equation? The terms were exchanged. Based on the previous activity, which property is applied? + 48. Commutative of addition: For integers a, b, a + b = b + a If the operation is replaced by multiplication, does the same property apply? Give an example to prove your answer. 2 • 3 = 3 • 2 6 = 6 Commutative property of multiplication: For integers a, b, ab = ba Define the property. Commutative property Changing the order of two numbers that are either either added or multiplied, the result does not change. Give a real life situation in which the commutative property can be applied. An example is preparing fruit juices - even if you use the powder first for water or vice versa, the product will still be the same fruit juice. Test the property on subtraction and division operations using simple examples: 6 - 2 = 2 - 6 6 ÷ 2 = 2 ÷ 6 4 ≠ -4 3 ≠ B. Fill in the + is the same + + 49. If a represents the number of mobile phones, b represents the ipods and c represents the laptops, show the mathematical instruction in the diagram below. (+++++=++(++) Expect blanks with the correct numeric values of the set of mobile phones, ipods, and laptops. answer: (a + b) + c = a + (b + c) Guide questions: What operation is used to illustrate the diagram? Addition for integers a, b and c. (a + b) + c = a + (b + c) If the operation is replaced by multiplication, does the same property apply? Give an example to prove your answer. (2 • 3) • 5 = 3 • (2 • 5) 6 • 5 = 3 • 10 30 = 30 Associative property of multiplication for integers a, b and c, (a • b)c = a b • c) Define the property. Associative property Changing the grouping of numbers that are added or multiplied does not change their value. Give a real life situation in which associative ownership can be applied. An example is preparing instant coffee - even if you combine coffee and creamer than sugar or coffee and sugar then creamer the result will be the same - 3-in-1coffee. Test the property on subtraction and division operations using simple examples. What did you find out? Associative power does not apply to subtraction and subtraction as shown by the following examples:  $(6 - 2) - 1 = 6 - (2 - 1)(12 \div 2) \div 2 = 122 \div \div <2> <3> (2 \div 2) 4 - 1 = 6 - 16 \div 2 = 12 \div 13 \neq 53 \neq 1250$ . C. Fill in the blanks with the correct numeric values of the orange set and the set of strawberries. If a representative represents the multiplier at the front, b represents the set of oranges and c represents the set of strawberries, show the mathematical instruction in the diagram below. \_\_\_\_\_ (\_\_\_\_ Distributive Property For integers a, b, c,
a(b + c) = ab + ac For integers a, b, c, a b ac Define the property. Distributive Property When two numbers are added/deducted and then multiplied by one factor, the result will be the same +2 × equal to +2 × 51. when each number is multiplied by the factor and the products are then added/deducted. In the said property, we can add/subtract the numbers within the brackets and then first multiply or multiply and then add/subtract them? Give an example to prove your answer. In the example, we can first add or subtract the numbers within the brackets and then multiply the result. or we can multiply each term individually and then add/subtract the two products together. The answer is the same in both cases, as shown below. Give a real life situation where the distributive property can be applied. Your mother gave you four 5-peso coins and PhP80 worth of 5-peso coins and PhP80 worth of 20-peso bill. You also have four sets of PhP25 each consisting of a 5-peso coin and a 20peso bill. D. Fill in the spaces with the correct numeric view of the given illustration. Answer: a + 0 = a guide question: Based on the previous activity, which property is applied in the presented images? Identity Property for Addition  $a + 0 = a -2(4 + 3) = (-2 \cdot 4) + (-2 \cdot 3) -2(7) = (-8) + (-6)) -14 = -14$  or -2(4 + 3) = -2(7) -2(7)= -14 -14 = -14 52. What is the result if you have something represented by adding a number to nothing represented by zero? The result is the non-zero number. What do you call zero 0 in this case? Zero, 0 is the additive identity. Define the property. Identity Property for Addition states that 0 is the additive identity, that is, the sum of a number and 0 is the specified number. Is there a number multiplied by a number that will result in that same number? Give examples. Yes, the number is 1. Examples: 1•2=2 1•3=2 1•4=2 What property is illustrated? Define. Identity Property for Multiplication says that 1 is the multiplicative identity - the product of a number and 1 is the given number, a 1 = a. What do you call a 1 in this case? One, 1 is the multiplying identity E. Give the correct mathematical explanations below. Guide questions: How many cabbages are there in the crate? 14 cabbage in PLUS REMOVE E 53. Using integers, represent put in 14 cabbage and remove 14 cabbage? What will be the result if you add these performances? (+14) + (-14) = 0 Based on the previous activity, which property for a + (-a)= 0 What is the result if you add something to the negative? The result is always zero. What do you call the opposite of a number in terms of character? What is the opposite of a number number a is -a. Define the property. Reverse property for additive inverse of the number and the additive is reversed or negative, zero. What do you mean by reciprocal, and what is the other term used for it? The reciprocal is 1 divided by that number or the fraction a 1, where a represents the number. The reciprocal of a number is also called the multiplying inverse. If you multiply some say 5 with its multiplicative inverse, what is the result? 5 • = 1 What property is illustrated? Define this property. Reverse property for multiplication - states that the product of a number and the multiplying inverse or reciprocal, is 1. For each number a, the multiplicative reverse is a 1. Important terms to remember The following are terms that you should remember from this point. 1. Closing pan Two integers that are added and multiplied remain as integers. The set of integers is closed under addition and multiplication. 2. Commute The order of two numbers that are added or multiplied does not change the grouping of numbers that are added or multiplied does not change their value. 4. Distributive property 54. When two numbers are added/deducted and then multiplied by one factor, the result is the same when each number is multiplied by the factor and the products are then added/deducted. 5. Identity - states that the sum of a number and 0 is the given number. Zero, 0 is the additive identity. Multiplicative identity - states that the product of a number and 1 is the given number, a • 1 = a. First, 1 is the multiplying identity. 6. Reverse property in addition - states that the sum of a number and the additive inverse of the number and the multiplying identity. 6. Reverse property in addition - states that the sum of a number a is -a. In Multiplication - states that the sum of a number and the additive inverse of the number and the multiplying identity. number a is a 1. Formats and symbols In this segment, you'll learn some notations and symbols related to real number property of addition a, b I, then a+b I, a • b I Commutative property of addition a + b = b + a commutative property of multiplication ab = ba Associative property of addition (a + b) + c = a + (b + c) Associative property of multiplication (ab) c = a (bc) Distributive property a + 0 = a Multiplicative identity property a + 0 = a Multiplicative identity property a + (-a) = 0 55. NOTE TO THE TEACHER: It is important for you to examine and discuss your students' answers to the guestions asked in each activity and exercise in order practice what they have learning process is essential to find out if the students gained knowledge of the concept or not. It is also appropriate to encourage brainstorming, dialogue and arguments in the classroom. After the exchanges, make sure all questions are resolved. III. Exercises A. Complete the following expressions using the given property (12-5)a 2. (7a)b Associative Property 7 (ab) 3. 8 + 5 Commutative Property 5 + 8 4. -4(1) Identity Property -4 5. 25 + (-25) Inverse Property 0 C. Fill in the spaces and determine which property 2. -4 + 4 = 0 Additive inverse 3. -6 + 0 = -6 Additive identity 4. (-14 + 14) + 7 = 7 Additive Identity 5. 7 x (0 + 7) = 49 Additive Identity Given Property 1. 0 + (-3) = -3 Additive Identity Property 2. 2(3 - 5) = 2,3 - 2(5) Distributive property 3. (-6) + (-7) = (-7) + (-6) Commute 4. 1 x (-9) = -9 Multiplication identity property 5. -4 x - = 1 Multiplication Inverse Property 6. 2 x (3 x 7) = (2 x 3) x 7 associative property 7. 10+ (-10) = 0 Additive inverse property 8. 2(5) = 5(2) Commute 9. 1 x (-) = - Multiplication identity property 10. (-3) (4 + 9) = (-3)(4) + (- 3)(9) Distributive property 56. NOTE TO THE TEACHER Try more of the kind of exercises in Exercise C. Combine properties so you can test how well your students have understood the lesson. Summary The lesson on properties or real numbers explains how numbers or values are arranged or related in a comparison. It further clarifies that no matter how these numbers are arranged and what processes are used, the composition of the equation and the final answer is still the same. Our society is like these equations composed of different numbers and operations, different people with different personalities, perspectives and experiences. We can choose to look at the differences and forever emphasize our advantage or superiority over the others. Or we can focus on the common ality of people and work entirely for the common good. A peaceful society and harmonious relationship begin with recognizing, appreciating and fully maximizing the positive gualities that we as a people have in common. 57. Lesson 6: Rational numbers in the number line time: 1 hour Condition Concepts: Subsets of real numbers, goal of integers: In this lesson, you, the students, are expected to 1. rational numbers too 2. illustrate rational numbers on the number line; 3. Arrange rational numbers on the number line. NOTE TO THE TEACHER: Ask students about the relationship of the rational numbers set to the set of integers and the set set (Lesson 4). This lesson challenges students in their numerical estimation skills. How accurately can they find rational numbers between two integers, perhaps, or between two numbers? Lesson Right I. Activity Determine whether the following numbers or not. - 2, , 1 11, 43, 16, -1.89, Now, try to locate them on the actual number line below by plotting: II. Ask To Think About the following examples and answer the following questions: a. 7 ÷ 2 = 3 1/2, b. (-25) ÷ 4 = -6 1/4 c. (-6) ÷ (-12) = 1/2 1. Are quotients integers? Not always. Consider 10 7. 2. What kind of numbers
are they? Quotients are rational numbers. 3. Do you represent them on a number line? Yes. Rational numbers are real numbers and therefore they can be found in the real number line. 0-1-2-3 1 2 3 4 NOTE THE TEACHER: Give as many rational numbers as the class can allow time. Give them in different forms: integers, fractional numbers, decimals, repeating decimal places, etc. Remember what rational numbers are... 3 1/2, -6 1/4, 1/2, are rational numbers. The word rational is derived from the word ratio which means quotient. Rational numbers are numbers that can be written as a quotient of two integers, where b  $\neq 0$ . Below are more example we can see that an integer is also a rational numbers are a subset of rational numbers. Why is that? Let's look at your work sooner. Among the specified numbers, -2, , 1 11, 43, 16, -1.89, the numbers and 43 are the only ones that are not rational numbers. Neither can be expressed as a quotient of two integers. However, we can express the other as a quotient of two intergers: 2 2 1, 16 4 4 1, 1.89 189 100 Of course 1 11 is already a quotient in itself. We can find rational numbers on the real number line. Example 1. Find 1/2 on the number line. A. The number line. A. The number line. A. Since 0&It; 1/2 &It; 1, plot 0 and 1 on the segment from 0 to 1. The center now corresponds to 1/2 Example 2. Find 1.75 on the number line. A. The number 1.75 can be written as 7 4 and, 1 < 7 4 &lt; 2. Divide the segment from 0 to 2 into 8 equal parts. B. The 7th mark of 0 is the point 1.75. 1.7510 2 10 2 0 1 1/2 0 1 59. Example 3. Find the point on the number line. Note: -2 &lt; &lt; -1. Dividing the segment from -2 to 0 into 6 equal parts, it is easy to plot. The number is the 5th mark from 0 to the left. Go back to the opening activity. You were asked to locate the rational numbers and put them on the real number line. Before doing that, it is useful to arrange them in order from least to largest. To do this, you take all the numbers out in the same shape - as similar fractures or as decimals. Because integers are easy to find, they don't have to take but less than 1, and rank them from least to the largest on the real number line? Examples are: 1 10, 3 10, 1 2, 1 5, 1 100, 0, 1 8, 2 11, 8 37, 9 10 12 2 0 -2 -1 0 NOTE TO THE TEACHER: You will be given a number line to work on. Plot the numbers on this number line to serve as your answer key. 60. 3. Name a rational number x that matches the descriptions below: a. 10 x 9. Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 3.1. 3.01. 3.001. 3.12 d. 1 4 x 1 3 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answers: x 46 5. 48 5. 9.75. 9 8 9 . 9.99 b. 1 10 x 1 2 Possible answ TO THE TEACHER: Sworn this lesson with a summary and an example of what students are expected to learn about rational numbers, their properties, edits and applications. Summary In this lesson you learned more about what are rational numbers and where they can be found in the real number line. By turning all rational numbers into equivalent forms, it is easy to regulate them in order, from least to the largest or vice versa. NOTE TO THE TEACHER: In this exercise you allow students to use the calculator to check if their choice of x falls within the given range. You, as always also encourage them to use mental calculation strategies as calculators are not readily available. Most importantly, students have a way to check their answers and won't just rely on you to give the right answers. 61. Lesson 7: Forms of rational numbers, subsets of real numbers, fractions, decimals Objectives: In this lesson you are expected: 1. rational numbers from fractional form to decimal form (ending and repeating and non-terminating) and vice versa; 2. add and subtracting rational numbers; 3. solve problems by adding and subtracting rational numbers. NOTE TO THE TEACHER: The first part of this module is a lesson on changing rational numbers from one form to another, with particular attention to changing rational numbers into non-terminating and repeating decimal form. It is believed that students know decimal form. It is believed that students know decimal form in fractures and how to work on fractures and decimals. Lesson Correct: A. Forms of Rational Numbers I. Activity 1. the following rational umbers in fractional form or mixed number form in decimal form: a. 1 4 = -0,25 d. 5 2 = 2,5 b. 3 10 = 0,3 e. 17 10 = -1,7 c. 3 5 100 = 3,05 f. 2 1 5 = -2,2 2. The change in the rational numbers in decimal form to fraction form. a. 1,8 = 9 5 d. -0,001 = 1000 1 b. - 3,5 = 7 2 e. 10.999 = 1000 10999 c. -2,2 = 11 5 f. 0,11 = 1 9 NOTE TO THE TEACHER: NOTE FOR THE TEACHER: These should be treated as revision exercises. There is no need to spend too much time assessing the concepts and algorithms involved here. 62. The discussion that follows assumes that students remember why certain fractures are easily converted into decimal places. It is not so easy to change fractures in decimal places if they are not decimal fractions. Be aware of the fact that this is the moment when the concept of a set is now some (rational) whose parts (counter and denominator) can be treated separately and can even be divided! This is an important shift in concept, and students need to be willing to understand how these concepts are consistent with what they have learned from elementary level mathematics. II. Discussion Non-decimal fractions There is no doubt that most of the above exercises were easy for you. This is because all but point 2f are what we call decimal fractions. These numbers are all parts of the power of 10. For example, 1 4 = 25 100 that is easily convertible to a decimal fraction? How do you move from one form to another? Remember that a rational number is a quotient of 2 integers. To change a rational number in fraction form, all you need to do is divide the counter by the denominator. Think of the number 18. The smallest force of 10 that is shareable by 8 is 1000. But, 18 means you divide one whole unit into 8 equal parts. Therefore, first divide 1 whole unit into 1 000 equal parts and then take 18 of the thousandth part. That's equivalent to 1000 125 or 0.125. Example: Change 1 16, 9 11 and 1 3 in their decimal places. The smallest force of 10 that is shareable by 16 is 10,000 or 0.625. You get the same value if you run the long division 1 16. 63. Do the same for 9 11. Enter the long division 9 11, and you need to obtain 0.81. Therefore 9 11 = 0.81. Also 13 0.3. Please note that both 9 11 and 13 are non-terminating but repeating decimal places. To change rational numbers in decimal forms, express the decimal part of the numbers as a fractional part of a power of 10. -2.713, for example, can initially be changed to 2 713 1000 and then amended to 2173 1000. What about non-terminating, but repeating decimal forms? How can they be changed to fractional form? Study the following examples: Example 1: Change 0.2 in the fraction form. Solution: Let r 0.222... 10r 2,222... Then subtract the first comparison from second comparison and obtain 9r 2,0 r 2 9 Therefore 0,2 = 2 9 . Example 2. Change 1.35 in the fraction form. Solution: Let r 1.353535... 100r 135.353535... Then subtract the first equation from the second equation and obtain 99r 134 r 134 99 1 35 99 Therefore 1,35 = 135 99 . TEACHER'S NOTE: Now that students are clear about how to add and subtract them. Students will quickly realize that these skills are the same skills they have learned in elementary mathematics. Since there is only 1 repeated digit, multiply the first equation by 10. Since there are 2 repeated digits, multiply the first equation by 100. In general, if there are n repeated digits, multiply the first comparison by 10n. 64.B. Addition and subtraction of rational numbers in fraction form I. Activity Remind us that we added and subtracted whole numbers using the number line or by using objects in a set. Using linear or area models, find the sum or difference. a. = \_\_\_\_\_ c. = \_\_\_\_ b. = \_\_\_ common denominator always the largest of the two denominators? 3. What is the least common denominator of fractures are replaced by a few similar fractures? Problem: Copy and complete
the fraction magic square. The sum in each row, column, and diagonal must be 2. » What are the values of a, b, c, d and e? a = 16, b = 43, c = 415, d = 1330, e = 761/27/51/3 c d e 2/5 a b 65. TEACHER NOTE: The following pointers are not new to students at this level. However, if they don't master how to add and subtract fractions and decimals well, this is the time for them to do so. Important things to remember to add or deduct break with the same denominator. If a, b and c indicate integers, and b  $\neq 0$ , then and with different denominators, where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and d  $\neq 0$  If the fractions to be added or subtracted are uneven where b  $\neq 0$  and b  $\neq 0$  and b  $\neq 0$ . is the least common multiple of b and d » Add or dip the counters, and the denominator of which is the result as a fraction of which is the least common multiple of b and d. Examples: Add: To subtract: a.a.b.b. LCM/LCD of 5 and 4 is 20 NOTE THE TEACHER: Below are the answers to the activity. Make sure students clearly understand the answers to all the questions and concepts behind each questions in activity. You were asked to find the sum or difference of the groups given. a. = c. = b. = d. = How would you get the sum or difference without using the models? You must apply the rule to add or subtract similar fractions. 66. 1. Is the common denominator always the largest of the two denominators? Not always. The least common denominators and it may not be the largest of the two denominators and it may not be the largest of the two denominators and it may not be the largest of the two denominators. 3. What is the least common denominators and it may not be the largest of the two denominators and it may not be the largest of the two denominators. 3. What is the least common denominator of fractures in each example? (1) 6 (2) 21 (3) 15 (4) 35 (5) 12 (6) 60 4. Is the resulting sum or difference the same as when a few uneven fractures are replaced by a few similar fractures? Yes, as long as the replacement groups are the same as the original groups are the same as the original groups. NOTE TO THE TEACHER: Answers in simplest form or lowest terms can mean both mixed numbers with the fractional part in simplest form or an incorrect fraction whose counter and denominator have no common factor except 1. Both are acceptable as simplest forms, III. Exercises Do the following exercises. A. Perform the simplest form, 1 = 239, = 25362, = 13510, = 6718313183, = 1110111011, = 5124, = 1612, = 721166115, 2 = 7413, = 986. = 239 28 8 15 28 14. = 11 18 7. = 9 11 12 15. = 87 8 10 7 8 8. = 6 3 7 67. B. Give the reguested number. 1. What is three more than three and a fourth? 6 1 4 2. Subtract from the sum of . What is the result? 263 30 8 23 30 3. Increase the sum of . What is the result? 12 4. Decline. What is the result? 647 40 16 7 40 5. What is? 423 35 12 3 35 c. Solve any problem. 1. Michelle and Corazon compare their heights. If Michelle's height is 120 cm and the height of Corazon is 96 cm. What is the difference in their heights? Answer: 24 5 12 cm 2. Angel bought meters silk, meters satin and meters velvet. How many meters of dust did she buy? Answer: 18 13 20 m 3. Arah needs kg of meat to serve 55 guests. If she has kg of chicken, a kg of pork and kg of beef, is there enough meat for 55 guests? Answer: Yes, she's got enough. She has a total of 10 12 kilos. 4. Mr. Tan has gallons of gasoline in his car. He wants to travel far, so he added 16 more liters. How many gallons of gas is in the tank? Answer: 29 9 10 litreS NOTE THE TEACHER: Please note that the language here is crucial. Students must translate the English sentences if necessary. You, the teacher should probably make the calculator to prevent computer errors. 68. 5. Na Na the litres of water are reduced to 9 litres. How much water has evaporated? Answer: 8 1 12 literS NOTE TO THE TEACHER: The last part of this module is on the addition and subtraction of rational numbers. Emphasize that these decimals are the result of the counter divided by the denominator of a quotient of two integers. C. Addition and subtract decimal places. 1. Print out the decimal numbers in fractions, then add or subtract as described earlier. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers in a column so that the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers in a column so that the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 + = or 6.35 2. Arrange the decimal numbers. Example: Add: 2.3 + 7.21 Subtraction:: 9.6 - 3.25 (2 + 7) + (9 - 3) + 9 + = or 9.51 6 21.36 + 8.7 = 1932.06 6 700 - 678.891 = 21.109 2 45.08 + 9.2 + 30.545 = 84.825 7 7.3 - 5.182 = 2.118 69.3 900 + 676.34 + 78.003 = 1654.343 8 51.005 - 21.4591 = 29.5459 4 0.77 + 0.9768 + 0.05301 = 1.79981 9 (2.45 + 7.89) - 4.56 = 5.78 5 5.44 - 4.97 = 0.47 10 (10 - 5.891) + 7.99 = 12,099 2. Solve the following problems: a. Helen had P7,500 for retail money. When she got home, she had P132.75 in her pocket. How much did she spend to shop? P7.367.25 b. Ken contributed P69.25, while John and Hanna each gave P56.25 for their gift to Miss Daisy. How much could they collect? P181.75 c. Ryan said, I'm thinking of a number N. If I deduct 10.34 of N, the difference is 1.34. What's Ryan's number? -41.58 e. Kim ran the 100 meters in 135.46 seconds. Tyron was 15.7 seconds faster. What's Tyron's time for the 100-meter dash? 119.76 NOTE TO THE TEACHER: The summary is important especially because this is a long module. This lesson gave students numerous exercises to help them master the addition and subtractation of rational numbers. SUMMARY This lesson began with a number of activities and instructions on changing rational numbers from one form to another and continued to discuss addition and subtracting of rational numbers. The exercises given were not merely calculating. There were thought questions and problem-solving activities that helped deepen one's understanding of rational numbers. 70. Lesson 8: Multiplication and Distribution of Rational Numbers Time: 2 Hours Condition Concepts: adding and subtracting rational numbers; 2. Share rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3.
solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution of rational numbers; 3. solve problems with multiplication and distribution and distribution and distribution and distribution and distribution and distribution and elementary math. It begins with the visualization of the multiplication and distribution of rational numbers using the area model. Use different but appropriate shapes when illustrating using the area model. The opening activity encourages students to use a model or drawing to help them solve the problem. Although some students will insist that they know the answer, it is a very different skill to teach them to visualize using the area model. Lesson correct A. Models for multiplication and Division I. A pizza is divided into 10 equal slices. Kim ate the pizza, What part of the whole pizza did Kim eat? 2. Miriam made 8 chicken sandwiches for some street kids. She cut each sandwich into 4 triangular pieces. If a child can only take a piece, how many children can she feed? you have a model or a drawing to help you solve these problems? One model that we can use to illustrate multiplication and distribution of rational numbers is the area model. What's 14-13? Let's say we represent a bar of chocolate 1 unit. First divide the bar vertically into 4 equal parts. Part of it is 14 71. Then, divide each fourth into 3 equal parts, this time horizontally to see the divisions easily. Part of the horizontal distribution is 13. There will be 12 equal-sized pieces and one piece is 1 12. But, that one piece is 1 3. out of 14, which we know from elementary mathematics to mean 1 3 14. NOTE TO THE TEACHER The area model is also used to visualize the distribution of rational numbers in fraction form. This may be useful for some students. For others, the model may not be easy to understand. But don't give up. It's a matter of getting used to the model. In fact, this is a good way to help them use a non-algorithmic approach to sharing rational numbers in fractional form: by using the idea that distribution of rational numbers? Take the division problem: 4 5 1 2. A unit is divided into 5 equal parts and 4 of them are shaded. Each of the 4 parts will now be cut in half Since there are 2 divisions per part (i.e. 15) and there are 4 (i.e. 15), then there will be 8 pieces of the 5 original pieces or 451285. 131411272. NOTE THE TEACHER The solution to the problem 4512 can also be easily controlled using the Ask students what is 1285. The answer can be obtained using the area model 1 2 8 5 = 4 5 NOTE to the teacher: It is important for you to go over the answers of your students to the questions and exchanges in the classroom. Don't leave questions unanswered. II. Post-Activity Discussion questions Let's answer the questions in the opening activity. 1. A pizza is divided into 10 equal slices. Kim ate the pizza. What part of the whole pizza did Kim eat? 1/2 3/5 NOTE TO THE TEACHER The field model works for multiplication of rational numbers because the operation is binary, which means that it is

an operation performed on two elements. The area model allows for at most shading or cutting in two directions. 3 5 1 2 3 10 Kim ate 3 10 of the whole pizza. 73. 2. Miriam made 8 chicken sandwiches for some street kids. She cut each sandwich into 4 triangular pieces. If a child can only take a piece, how many children can she feed? The equation is 8 1 4 32. Since there are 4 quarters in one sandwich, there will be 4 x 8 = 32 triangular pieces and so 32 children can be fed. How can you multiply or divide rational numbers. From now on, be consistent in your rules so that your students are not confused. Give numerous examples, Important rules to remember The following are rules you should remember. From here, the symbols to be used for multiplication are one of the following: . x, or x, 1. To multiply rational numbers in fractional form, simply multiply the counters and multiply the denominators. In symbol, where: b and d NOT equal to zero, (b ≠ 0; d ≠ 0) 2. If you want to divide rational numbers into fraction (called the divisor) and multiply them by the first fraction. 74. In symbol, where: b, c, and d are not equal to zero. Example: Multiply the following and write your answer in the simplest form a.b. Divide: = III. Exercises. Do the following exercises. Write your answer to the available spaces: 1. Find the products. Express in the lowest terms (i.e. the counter and denominators have no common factor except 1). Mixed numbers are also acceptable: a. = 5 9 f. = 51 2 25 1 2 b. 7 = 14 3 4 2 3 g. = 1 10 c. = 2 25 h. = 1 36 d. = 325 9 36 1 9 i. = 4 9 e. = 5 12 j. = 3 10 The easiest way to solve for this number is to change mixed numbers in an incorrect fraction and then multiply them. Or use prime factors or the largest common factor, as part of the multiplication process. Take the reciprocal van, which then multiply by the first fraction. Using prime factors, it is easy to see that 2 can be weighed out of the counter then cancelled with the denominator, 75.B. Divide: 1. 20 = 30 6. = 10 9 1 1 9 2. = 5 9 7. = 79 12 6 7 12 3. = 7 40 8. = 7 6 1 1 6 4. = 69 80 9. = 10 33 5. = = 2 4 1 2 10. = 6 C. Solve the following: 1. Julie spent hours as julie did. How many third are there in 6 fifth? 18 5 3 3 5 3. Hanna donated her monthly allowance to the Iligan survivors. If her monthly allowance is P3.500, how much did she donate? P1400.00 4. The registration for this school year is 2 340. As his sophomores and his seniors, how many are freshmen or juniors? 1 365 students are freshmen or juniors? of leftover cake. How much of the cake did each employee take home? 110 of the cake. B. Multiplication and Distribution of rational numbers in decimal form. Don't get stuck on the rules. Give a deeper explanation. Think: 6.1 0.08 6 1 10 8 100 488 1000 0.488 76. The decimal places indicate the powers of 10 used in the denominators, hence the rule to determine where the comma in the product should be indicated. This unity will draw on your previous knowledge of multiplication and distribution of whole numbers. Think of the strategies you've learned and developed when working with whole numbers. Activity: 1. Give students different examples of multiplication phrases with the answers given. Place the decimal point in an incorrect place and ask students to explain why the decimal place should not be placed there and explain where it should be placed and why. Example: 215.2 x 3.2 = 68,864 2. Five students ordered buko cake, and the total cost is P135.75. How much did each student have to pay if he shared the cost equally? Questions and points to ponder: 1. When multiplying rational numbers in decimal form, pay attention to the importance of knowing where to imitate the decimal point in a product of two decimal numbers. Do you see a pattern? Take the sum of the decimals in each of the multiplicand and multiplier and that is the number of places in the groduct. 2. When dividing rational numbers into decimal desals, how do you determine where you place the decimal point in the groduct. places in the quotient depends on the number of decimal places in the dealer and the dividend. NOTE TO THE TEACHER Answer to the questions and points to consider is to be worked out when you discuss the following rules. Rules for multiplying rational numbers in decimal form 1. Arrange the numbers in a vertical column. 2. Multiply the like multiplying whole numbers. 3. From the rightmost end of the product, move the decimal point to the left the same number of places in the multiplicand and multiplier. Rules in a whole number, divide the dividend by the dealer who applies the rules of a whole number. The position of the decimal point is the same as that in the dividend. 2. If the dealer is not an integer, make the dealer to the rightmost end, making the number appear a whole number. 77. 3. Move the decimal point in the dividend to the right the same number of places as the decimal point was moved to make the dealer a whole number. 4. Finally, the new dividend is distributed by the new dealer. Exercises: A. Perform the specified operation 1.  $3.5 \div 2 = 1.756$ ,  $27.3 \times 2.5 = 68.252$ ,  $78 \times 0.4 = 31.27$ ,  $9.7 \times 4.1 = 39.773$ ,  $9.6 \times 13 = 124.88$ ,  $3.415 \div 2.5 = 1.3664$ ,  $3.24 \div 0.5 = 6.489$ .  $53.61 \times 1.02 = 54.6822 5$ .  $1.248 \div 0.024 = 52 10$ .  $1948.324 \div 5.96 = 326.9 B$ . Finds the numbers that give the products shown when multiplied. 1..3..5..x x x 10. 6 2 1 . 6 2 1 . 9 8 2 . . 4. . x x 1 6 . 8 9 . 5 NOTE TO THE TEACHER Give a good summary of this lesson highlighting how this lesson was intended to deepen their understanding of rational numbers and better develop their skills in multiplying and sharing rational numbers. Summary In this lesson, you learned to use the field model to illustrate multiplication and distribution of rational numbers. You also learned the rules for multiplying and sharing rational numbers in both the fraction and the decimal places. You solved problems by multiplication and distribution of rational numbers. Answers: (1) 5,3 x 2; (2) 8,4 x 2 or 5,6 x 3; (3) 5,4 x 4; (4) 3,5 x 3; (5) 3.14 x 7 NOTE TO THE TEACHER: These are just some of the possible pairs. Be open to accept or consider other pairs of numbers. 78. Lesson 9: Properties of operations by rational numbers Objectives: In this lesson, you are expected to become 1. Describe and illustrate the different properties of the operations on rational numbers. 2. Apply the properties when performing operations to rational numbers. NOTE TO THE TEACHER: Generally, rational numbers seem difficult among students. The following activity should be fun and can help your students. Lesson correct: I. Activity Choose a pair 2 14 3 5 0 1 13 40 13 12 1 3 3 20 In the box above, choose the correct rational number to be placed in the rooms to make the comparison a better place. 1. [13 12]2. = [13]3. = 0 [0] 8. 25 \_\_\_\_3 4 3 20 [12] 4. 1 x [] = 9. = \_\_\_\_ [3 20] 5. + [0] = 10. = [13 40] Answer the questions: 1. What is the missing number in point 1? 2. How do you compare the answers in points 1 and 2? 3. What about point 3? What's the missing number? 79. 4. In point 4, what do you multiply by 1 get? 5. What number must be added in points 6 and 7? 7. What do you say about the grouping in points 6 and 7? 8. What do you think the answers are in points 8 and 9? 9. What operation did you apply in Article 10? NOTE THE TEACHER The follow-up problem below could make the points raised in the previous activity clearer. Problem: Consider the given phrases: a.b. = \* Are the two expressions equal? If so, is the property pictured. Yes, the expressions in point (a) are the same and so are the expressions in point b). This is due to the commutative property of addition and multiplication. With the Commutative property you will change the order of the addends or factors and the resulting product, respectively, will not change. PLEASE NOTE THE TEACHER Discuss the following characteristics among your students. These properties make adding and multiplying rational numbers easier to do. PROPERTIES OF RATIONAL NUMBERS (ADDITION & amp; MULTIPLICATION) 1. CLOSURE PROPERTY: For two defined rational numbers., their sum and product is also rational. For example: a. = b. 2. COMMUTATIVE TRAIT: For two defined rational numbers, i. = ii. = 80. For example: a.b. 3. ASAEST OWNERSHIP: For three defined rational numbers. If are a defined rational numbers. If are a defined rational numbers, then for example: 5. DISTRIBUTIVE PROPERTY of multiplication over addition for rational numbers. If there are defined rational numbers, then for example: 6. IDENTITY ADDITION: Adding 0 to a number will not change the identity or value of that number. + 0 = For example: 81. Multiplication: Multiplicat equal to 0, i.e. For example: II. Ask to think (Post-Activity Discussion) NOTE TO THE TEACHER Answer every question in the opening Activity thoroughly and discuss their ideas, their doubts, and their questions. At this stage they really should be able to verbalize what they understand or don't understand so that they can properly address any misconceptions they have. If necessary, give additional examples. Let's answer the questions in the opening activity. 1. What is the missing number in point? » 2. How do you compare the answers in points 1 and 2? » The answer is the same, the order of the numbers is not important. 3. What about 3? What's the missing number is 0. When you multiply a number by zero, the product is zero. 4. In point 4, what number by zero, the product is zero. 4. In point 5 to get the same number? » 0, When you add zero to a number, the value of the number does not change. 6. What do you think the missing number is in points 6 and 7? » The groups are different, but do not affect the sum. 8. What do you think the answers are in points 8 and 9? » The answer is the same in both items. 9. What operation did you apply in Article 10? » The distributive property of multiplication over addition 82. III. Exercises: Do the following exercises: Do the following statements. 1. Commuting 2. 1 x = Identity property for multiplication 3. Distributive Property of Multiplication on Addition 4. Associative Property 5. 2715231 = 0 2. = N = 6 7 3. = + N = 12 30 83. 4. 0 + N = N = 1 6 7. N = 8 23 8. = N N = 8 9 NOTE TO THE TEACHER You would like to add more exercises. If you are sure that your students have mastered the attributes, remember to finish your lesson with a summary. Summary This lesson is about the properties of operations on rational numbers. The properties are useful because they simplify calculations of rational numbers. These property of Multiplication over Subtraction, Subtraction is considered as part of addition. Think of subtraction as the addition of a negative rational number. Number.

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