MTH 28.5 LECTURE NOTES (Ojakian)

Topic 2: Arithmetic with Integers

OUTLINE

References (1.2, .1.3, 1.4)

1. Adding/Subtracting (with negative numbers)

2. Multiplying/Dividing(with negative numbers)

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1. <u>Adding and Subtracting Integers</u>

   (a) Minus sign used in 2 ways:
      i. In between expressions: Subtraction operation
      ii. In front of expression: Take opposite

   (b) Using the number line
      i. Start at 0
      ii. Add Positive: Move right
      iii. Add Negative: Move left
      iv. Subtract Positive: Move left
      v. Subtract Negative: Move right

      PROBLEM 1. *Compute the following*

      A. $5 + 2 + (-4) + (-5)$

      B. $-5 + 6 + (-1)$

      PROBLEM 2. *Compute* $-5 - 2 - (-4) - (-5)$

      PROBLEM 3. *When we subtract a negative (for example:* $3 - (-10)$*), this is the same as doing what?*

      PROBLEM 4. *Compute the following*

      A. $-3 + 2 - (-4) - 2$

      B. $5 - 6 + 1 - (-2)$

      PROBLEM 5. *Calculate* $31 + 100 + (-33) - 1 - 100$ *in two ways: Directly, and using a property of addition/subtraction.*

   (c) Another way to add/subtract two numbers:
      i. Convert subtractions to addition
      ii. Positive + Positive: As usual.
      iii. Negative + Negative: Add absolute values, then put negative sign in front.
      iv. Negative + Positive:
         A. Find the difference (positive)
         B. If the negative has a larger absolute value, put a negative sign in front.
         C. If the positive has a larger absolute value, leave it positive.
      v.

      PROBLEM 6. *Compute the following*

$A.\ -100 - 320$

$B.\ -100 + 320$

$C.\ -320 - (-100)$

2. Multiplying and Dividing

    (a) As usual with the following sign rules.

        i. Positive and Positive $\rightarrow$ Positive

        ii. Negative and Positive $\rightarrow$ Negative [*Give reason for multiplication*]

        iii. Negative and Negative $\rightarrow$ Positive

        PROBLEM 7. *Compute the following:*

        $A.\ (4)(-5)$

        $B.\ -10 \div (-2)$

        PROBLEM 8. *Compute the following:*

        $A.\ (-3)(-20)(2)$

        $B.\ (-20)(2)(-3)$

        $C.\ 30 \div (-5)$

        $D.\ -5 \div 30$

        Some of the answers were the same. Describe a rule that tells you when this happens.

3. Bring in Zero

    (a) Add/subtract 0

    (b) Multiply with 0

    (c) Divide with 0