MATH 4
LESSON 1: THE REAL NUMBER SYSTEM

Part One: Classifying Numbers

Watch the Khan Academy video "Number Sets." [You can find a link to it on our class website or search on Khan Academy for "number sets."] In the video, Sal lists six number sets and examples of the numbers in those sets. Copy this list in the space below, then answer the practice questions that follow.

Practice

1. What is the ***most specific*** subset of real numbers that the following numbers belong in?

a. 5.67 b. $-\sqrt{6}$ c. $\frac{9}{5}$

d. 0 e. -75 f. $\sqrt{16}$

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2. List **ALL** the subsets that the following numbers are a part of.

a. 4

b. $\frac{6}{9}$

c. π

3. Determine if the following statements are true or false.

a. Integers are rational numbers.

b. Every whole number is a real number.

c. Integers are irrational numbers.

d. A natural number is a rational number.

e. An irrational number is a real number.

Part Two: Absolute Value

Watch the Khan Academy video "Absolute Value" and answer the questions below.

Absolute value =

Examples: $|-3|=$ $|4-5|=$ $-|-8|=$

Part Three: Integer Operations

Use the rules below to complete the integer operation problems in the next section. DO NOT USE A CALCULATOR!

Rules For Integer Operations

Addition

If both numbers have the same sign: Add. The answer will have the same sign.

Ex: 1 + 2 = 3 -1 + -2 = -3

If the numbers have different signs: Subtract the numbers. The answer will have the sign of the larger number.

Ex: 1 + -2 = -1 -1 + 2 = 1

Subtraction

To subtract a positive number: Change the "minus" to "plus a negative," then use the rules for addition.

Ex: 1 - 2 = 1 + -2 = -1 -1 - 2 = -1 + -2 = -3

To subtract a negative number: Two negatives cancel out and become a "plus."

Ex: 1 - -2 = 1 + 2 = 3 -1 - -2 = -1 + 2 = 1

Multiplication & Division

Same signs (pos x pos or neg x neg): Answer will be positive.

Ex: 1 x 2 = 2 -1 x -2 = 2

Different signs (pos x neg or neg x pos): Answer will be negative.

Ex: -1 x 2 = -2 1 x -2 = -2

Evaluate:

-(5) = -(-5) = -(-(-(-5))) = $-(-89)$ = $-(76)$ =

Find the sums:

$7+(-2)$ $-12+9$ $-6+1$

$-9+(-3)+(-2)=$ $-5.6+3.7$ $-\frac{23}{28}+\frac{1}{8}$

Find the differences:

$1-7$ $-7-5$ $4-(-6)$ $0-4$

$-7-(-3)$ $9-11=$ $-3-4=$ $-16-(-14)=$

$-3-(-3)=$ $4-3-12=$ $-8-9$ $-4-(-3)$

$-7-(-4)$ $-12-(-14)$ $-6-6$ $9-(-2)$

$2-8$ $0-(-10)$

Find the products:

$(-6)(2)$ $(-4)(-3)$ $(7)(-8)$ $-1(-7)$

$-4(1)(-2)$ $(-1)\times 6$ $(-8)(-2)$ $(-10)(9)$

$9(-5)$ $-11\times(-4)=$ $(-2)(-4)(-3)$ $(-5)(-2)(-5)$

Find the quotients:

$\frac{8}{-2}$ $\frac{-30}{5}$ $\frac{-12}{-2}$ $\frac{19}{-1}$

$7\div(-1)$ $-20\div(-5)$ $-\frac{50}{5}$ $90\div(-10)$

More subtraction:

Subtract -3 from 15:

Subtract -1 from -13:

Subtract 16 from 7:

Subtract -15 from -12:

Subtract the following:

$8-(-8)$ = _____

$-8-(-8)$ = _____

$-8-8$ = _____

$8-8$ = _____

$-2-3$ = _____

$-2-(-3)$ = _____

$2-(-3)$ = _____

$2-3$ = _____

Find the difference of -1 and 2.

Find the difference of 7 and 3.

Which of the following statements are TRUE? Select ALL true statements. (HINT: try different numbers to check each statement.)

____Subtracting a positive number from a negative number always gives you a negative number.
____Zero minus a number is the same as a number minus zero.
____Subtracting a - b is the same as adding a + (-b).
____Subtracting two negative numbers always gives you a negative number.
____A positive number minus a negative number is always a positive number.
____The difference of a number and its opposite gives you zero.

Part Four: Order of Operations

Watch the Khan Academy video "Intro to order of operations." Copy down the order of operations and complete the examples.

PEMDAS =

Examples:

$5-4^2$

$12\cdot 7-2\cdot 8=$

$(-2+5)^2$

$8\left[-4-(-1)\right]+4$

$-4-1\left[5-3\left(2^2+4\right)\right]$