Chapter 1 Foundations of Algebra

* 1. Structure of Algebra

Expression—An arithmetic operation that describes a calculation. Simplify, do not solve.

Equation—A mathematical relationship with an equal (=) sign

Inequality—A mathematical relationship with an inequality sign <,>, ≠, ≤, ≥

Absolute Value—Distance from 0 Always Positive

 Show physical example

1.2 Fractions

Fraction—0 on top=0

 0 on bottom is undefined

Always simplify to lowest terms

* 1. Adding and Subtracting Real Numbers +/- signs
	2. Multiplying & Dividing Real Numbers Properties

 Communicative Property of Multiplication: ab = ba

 2 terms, order does not matter 2\*3=3\*2 6=6

Associative Property of Multiplication: a(bc) = (ab)c

 grouping of 3 or more, grouping 2(3\*4) = (2\*3)4

 does not matter 2\*12 = 6\*4 24=24

Sign Rules for Multiplication and Division

Odd amount of negatives = \_\_\_\_\_\_\_\_\_\_

Even amount of negatives = \_\_\_\_\_\_\_\_\_\_

Multiplying Fractions

 Simplify \_\_\_\_\_\_\_\_\_\_.

 You can simplify anything in the \_\_\_\_\_\_\_\_\_\_ with anything in the \_\_\_\_\_\_\_\_\_\_.

 -11\* 3 \* 25 =

 9 10 22

Dividing Fractions

Keep it, \_\_\_\_\_\_\_\_\_\_ it, \_\_\_\_\_\_\_\_\_ it KCF

 -12 ÷ 3 =

 5 10

* 1. Exponents, Roots & Order of Operations

 Exponents 2⁴=2\*2\*2\*2 = 16 2 is the base 4 is the exponent

 - 3⁴ ≠ (-3)⁴

 Radicals $\sqrt{81}$= 9

 Order of Operations P E M A

D S

Parenthesis—Grouping Symbols ( ), [ ], │ │, √

Exponents

Multiplication or Division left to right

Addition or Subtraction left to right

* 1. Translating Word Phrases to Expressions

Key Words

 Addition: Sum, plus, add, more than, increase

 Subtraction: Minus, decrease, less, less than, subtract, difference, take away, reduce

 Multiplication: Times, Multiply, Twice, triple, of (%)

 Division: into, ratio, quotient, split, group

 Exponents: power, raised to, squared, cubed, square root

 Equals: Total, is, equals, equivalent to

**And** is a separator

**Than/From** flips the order from which the phrase is read \*\*\*\*\*\*\*\*\*\*

**All** indicates parenthesis

The sum of x and 3

3 more than a number

The difference of x and 3

3 *less than* a number

5 decreased by a number

X *subtracted from* y

Twice a number

M divided by n

p divided into y

The ratio of a to b

2 less than the product of 5 and m

5 times the sum of x and 2

Triple the difference of A and B

The difference of m and n subtracted from negative 7

The sum of x and 3 subtracted from the difference of A and B

* 1. Evaluating and Rewriting Expressions

Simplifying

Distribution→ multiply 2(3x + 5) = \_\_\_\_\_\_\_\_\_\_\_\_

Combining like terms 6x + 2y + 3x – 7y = \_\_\_\_\_\_\_\_\_\_