Notes 2.4

Key Concept:

The product of two real numbers of the same sign is positive.

3(4) = 12

(-3)(-4) = 12

The product of two real numbers with different signs is negative.

 3(-4) = -12

 (-3)(4) = -12

Example: 5(-2)(-5) = (-10)(-5) = 50

 (-0.5)(-4)(-7) = (2)(-7) = -14

**Key Concepts:**

**Property of Zero: T**he product of a number and 0 is 0.

Algebra: a(0) = 0 Example: 7(0) = 0

**Property of -1:** The product of a number and -1 is the opposite of the number.

Algebra: a(-1) = -a Example: 8(-1) = -8

**Closure Property:** A set of numbers is closed under multiplication if the product of any two numbers I the set is also a number in the set.

Example: The set of integers is closed under multiplication because the product of any two integers is an integer.

**Vocabulary: Multiplicative identity:** The number 1 is called the multiplicative identity when using the identity multiplication property of equality: a(1) = a

Example:

Which property of equality is 6(-1) = -6?

Property of -1

Which property of equality is 9(0) = 0?

Property of Zero

Which property of equality is 2(5) = 5(2)?

Commutative Property

Which property of equality is 3a + 3b = 3(a + b)?

Associative Property

Which property of equality is 4(1) = 4

Identity Property

Which property of equality is 4$\left(\frac{1}{4}\right)=1$?

Inverse Property

Which property of equality is -5(3a + b) = (-5)3a + (– 5)b = -15a – 5b?

Distributive Property

Example:

In 1900 the elevation of Mono Lake in California was about 6416 feet. Approximate the elevation in 2000 given the following information.

1. From 1900 to 1950, the average rate of change in elevation was about -0.12 foot per year.
2. From 1950 to 2000, the average rate of change in elevation was about -0.526 foot per year.

Step 1: Write a verbal model:

New elevation = Original elevation + (Average rate of change)(time span)

New elevation = 6416 feet + (-0.12$\frac{ft.}{yr.}$)(50yrs.) + (-0.526$\frac{ft.}{yr.}$)(50yrs.)

New elevation = 6416 ft. + (-6 ft.) + (-26.3 ft.) = 6383.7 ft.