Section 1.7: MULTIPLICATION AND DIVISION OF REAL NUMBERS

When you are done with your homework you should be able to…

- Multiply real numbers
- Multiply more than two real numbers
- Find multiplicative inverses
- Use the definition of division
- Divide real numbers
- Simplify algebraic expressions involving multiplication
- Determine whether a number is a solution of an equation
- Use mathematical models involving multiplication and division

WARM-UP:

Find the value of each expression:

1. $\frac{9}{10}-\left(\frac{1}{4}-\frac{7}{10}\right)$

2. $-\left|-8-(-2)\right|-(-6)$

Write each English phrase as an algebraic expression. Let x represent the number:

1. The difference between 9 times a number and -4 times a number

2. The quotient of -7 and a number subtracted from the quotient of -12 and a number

THE PRODUCT OF TWO REAL NUMBERS

- The _____ of two real numbers with _____ signs is found by _____ their _____ values. The product is _____.
- The _____ of two real numbers with the _____ sign is found by _____ their _____ values. The product is _____.
- The _____ of zero and any real number is _____.

Example 1: Multiply.

1. $-15(5)$

2. $8.3(-2)$

3. $(-11)(-12)$

4. $\frac{4}{3} \cdot 0$

MULTIPLYING MORE THAN TWO NUMBERS

1. Assuming that no factor is zero,
   - The _____ of an _____ number of _____ numbers is _____.
   - The _____ of an _____ number of _____ numbers is _____.
2. If any _____ is _____, the product is _____.

Example 2: Multiply.

1. $-7(5)(-6)\cdot 2$

2. $(13)(-1)\left(-\frac{5}{2}\right)(-8)$

THE MEANING OF DIVISION

The result of _____ the real number _____ by the nonzero real number _____ is called the _____ of _____ and _____. We can write this _____ as _____ or _____. We can define division in terms of _____ by using _____ inverse or _____.

Example 3: Find the multiplicative inverse of each number.

1. 12

2. $-\frac{1}{4}$

3. $-\frac{7}{8}$

DEFINITION OF DIVISION

If *a* and *b* are real numbers and *b* is not equal to zero, then the _____ of _____ and _____ is defined as

The _____ of two real numbers is the _____ of the _____ number and the _____ _____ of the _____ number.

Example 4: Divide using the definition of division.

1. $5 \div \frac{1}{5}$

2. $\frac{-123}{-3}$

THE QUOTIENT OF TWO REAL NUMBERS

- The _____ of two real numbers with _____ signs is found by _____ their _____ values. The quotient is _____.
- The _____ of two real numbers with the _____ sign is found by _____ their _____ values. The quotient is _____.
- Division of any real number by _____ is _____.
- Any nonzero number divided into _____ is _____.

Example 5: Divide.

3. $-\frac{2}{5} \div \frac{1}{10}$

5. $\frac{123}{-3}$

4. $\frac{0}{123}$

6. $-1.8 \div (-0.6)$

ADDITIONAL PROPERTIES OF MULTIPLICATION

PROPERTY	MEANING	EXAMPLES
IDENTITY PROPERTY OF MULTIPLICATION		
INVERSE PROPERTY OF MULTIPLICATION		
MULTIPLICATION PROPERTY OF -1		
DOUBLE NEGATIVE PROPERTY		

NEGATIVE SIGNS AND PARENTHESIS

If a _____ sign precedes parentheses, _____ the parentheses and _____ the _____ of _____ _____ within the parentheses.

Example 6: Simplify.

1. $-4(-3x+2)$

2. $5(3y-1)-(14y-2)$

APPLICATIONS

Use the formula $C=\frac{5}{9}(F-32)$ to express each Fahrenheit temperature, *F*, as its equivalent Celsius temperature, *C*.

1. -13°F

2. 5°F