**Rational Numbers Handout #1**

**SECTION 1: Simplifying Fractions**

**Reminder:** When simplifying fractions, you will need to consider the factors (the numbers that can divide evenly into a given number) of the numerator (top) and the denominator (bottom).

**Definitions:**

* Greatest Common Factor (the GCF): the largest factor common to two or more numbers.
* Equivalent Fractions: Two or more fractions that are equal in value, but represented in different ways. When the fractions are in simplest form they are the same.

**Example #1:** What number can divide into 15 and into 20? (What is the greatest common factor?)

* The factors of 15 are 1, 3, 5, 15

The factors of 20 are 1, 2, 4, 5, 10, 20

* The GCF is 5

Divide both numbers by 5 = & are equivalent fractions!

**Example #2:** Ask yourself: What number can divide into 6 and into 9? The number 3 can!

Now, divide both the 6 and 9 by 3:

=

**PART A**

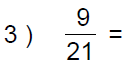
1. List all the factors of the following numbers:

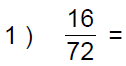
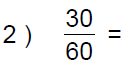
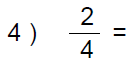
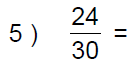
\*Please note that you can use the multiplication chart posted at the front left of class.

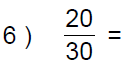
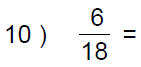
* 1. 22 c. 12
  2. 45 d. 27

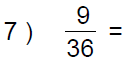
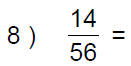
1. What is the greatest common factor of each pair of numbers?
   1. 12 and 6 c. 10 and 25
   2. 7 and 21 d. 8 and 12
2. Are the following pairs of fractions equivalent fractions?
   1. and c. and
   2. and d. and

**PART B**

Simplify the following fractions (into lowest terms):







**SECTION 2: Finding a common denominator**

**Reminder:** When finding a common denominator for two or more fractions, you will need to figure out what number both denominators can divide into (or the LCM).

* When fractions have a common denominator, they can be:
  + Put into order from least to greatest
  + Added, subtracted, multiplied, and divided

**Definition:**

* Lowest Common Multiple (the LCM): The smallest number that two or more numbers can divide into evenly.

**Example #1:** Find the common denominator for the following pair of fractions:

and Ask yourself: What number can both 10 and 2 divide into?

2 and 10 can both go into the number 10

The fraction already has 10 as the denominator, so it can stay as it is.

The fraction needs to be changed to a fraction with a denominator 10

* Ask yourself how many times does 2 go into 10?
  + It goes in 5 times (2 x **5** = 10)

Now, multiply both the numerator (1) and the denominator (2) by 5!

x 5 =

**Example #2:** Find the common denominator for the following pair of fractions:

and Ask yourself, what number can both 3 and 5 divide into?

Don’t know?????

* If you don’t know, do this (how to find the LCM):

3, 6, 9, 12, 15, 18, 21, 24 (keep adding 3….)

5, 10, 15, 20, 25, 30, 35 (keep adding 5…)

* You should continue both lines until they have a number in common!
* What number do they have in common? They both have the number 15!
* Now, you have to look at each denominator:

How many 3’s make 15? 5, so multiply top and bottom by 5:

x 5 =

How many 5’s make 15? 3, so multiply top and bottom by 3:

x 3 =

Now, they have a common denominator!

**PART A:** Find the LCM of the pair of numbers. Circle the LCM in each strand.

1. 4, \_\_\_, …… 2. 7, \_\_\_, ….

3, \_\_\_\_, …… 4, \_\_\_, ….

**PART B:** Find the common denominator for the following pairs of fractions.

1. and 2. and 3. and 4. and
2. and 6. and 7. and 8. and

**SECTION 3: Rules for adding positive and negative numbers**

* If BOTH numbers are NEGATIVE, then the answer will be NEGATIVE!
* If BOTH numbers are POSITIVE, then the answer will be POSITIVE!
* If there is one POSITIVE and one NEGATIVE number, then the answer will be:
  + Positive – if the larger number is positive
  + Negative – if the larger number is negative

**Example #1:** Add the following numbers:

(-8) + (-2) 🡪 both are negative, therefore the answer will be negative!

Now, just add the 8 and 2, and put a negative sign in front!

(-8) + (-2) 🡪8 + 2 = 10 🡪 -10

**Example #2:** Add the following integers:

(-9) + (+3) 🡪 the bigger number (9) is negative, so the answer will be negative!

* Now, take the smaller number (3) from the larger number (9)
  + 9 - 3 = 6
* (-9) + (+3) = -6

**Example #3:** Add the following decimals:

(-0.2) + (+4.5) 🡪the bigger number (4.5) is positive, so the answer will be positive!

* Now, take the smaller number (0.2) from the larger number (4.5)
  + 4.5 – 0.2 = 4.3
* (-0.2) + (+4.5) = +4.3

Example #4: Add the following fractions:

+ (+ 🡪 First, you need to make sure that they have a common denominator

before you can determine if the answer will be positive or negative.

* + The LCM of 8 and 4 is 8!
  + The first fraction already has 8 as a denominator so you can leave it for now.
  + To change ¾ : 4 goes into 8 twice, so you need to multiply top and bottom by 2.
  + (+ x 2 = (+
* + (+ = + (+ 🡪6 is bigger than 2, so the answer will be +
* Subtract the smaller numerator (2) from the larger one (6) =
* = (don’t forget to put the negative back in!)

**PART A:** Will the answer be positive or negative?

1. (-5) + (-6) 🡪
2. (-1.2) + (+3) 🡪
3. (+4.5) + (+2.6) 🡪
4. (+67) + (-23) 🡪

**PART B:** Add the following:

1. Add the following integers:
   1. (+13) + (-12) = c. (-23) + (-7) =
   2. (-4) + (+9) = d. (+18) + (+11) =
2. Add the following decimals:
   1. (-0.3) + (-1.5) = c. (+5.6) + (+1.2) =
   2. (-7.8) + (+1.4) = d. (-6.5) + (+9.7) =
3. Add the following fractions:
   1. + ( b. + ( c. + ( d. + (