**OPERATIONS WITH FRACTIONS**

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| A fraction is made up of two parts: The top of the fraction is called the numerator and the bottom of the fraction is called the denominator. If the numerator is greater than the denominator, the fraction is called an **improper fraction**. (Ex:). These types of fractions can also be written as a whole number and a fraction. This is called a **mixed number** (Example:). |

**REDUCING FRACTIONS**

When dealing with fractions, we need to express them in the most reduced form.

**Ex:** $\frac{3}{6}$is not in its most reduced form because 3 and 6 are both divisible by 3. As soon as you find a number that will divide the numerator and denominator, you have to reduce them.

|  |  |
| --- | --- |
| **METHOD 1** | **METHOD 2: CALCULATOR** |
| $$\frac{3}{6}=\frac{3÷3}{6÷3}$$ $=\frac{1}{2}$ | Input the numbers into your calculator as follows:A b/c3 6 $=\frac{1}{2}$ |

**Reduce** the following fractions without a calculator, then check the accuracy of your answer with a calculator:

|  |  |  |  |
| --- | --- | --- | --- |
| a. 4/16 | b. 14/35 | c. $2\frac{4}{12}$ | d. 30/ 50 |

**CONVERTING MIXED NUMBERS INTO IMPROPER FRACTIONS**

To convert mixed numbers to improper fractions:

$ $

|  |  |
| --- | --- |
| **METHOD 1: PENCIL AND PAPER** | **METHOD 2: CALCULATOR** |

|  |  |
| --- | --- |
| $$2\frac{3}{5}=\frac{2×5+3}{5}=\frac{10+3}{5}=\frac{13}{5}$$If $2\frac{3}{5}$ = 13/5 Then $-2\frac{3}{5}$ =  |  |

**Try these:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| a.   | b.   | c.  | d.   | e.  |

**ADDING AND SUBTRACTING FRACTIONS**

To add or subtract fractions the denominators must be the same. After finding the lowest (least) common denominator, you can add or subtract the numerators, and the denominators stay the same.

**Ex:** 1/3 + 1/6 =?

|  |  |
| --- | --- |
| **Step 1: List multiples of each denominator**multiples of 3 = multiples of 6 =  | **Step 2: Circle the smallest common number of each set of multiples****The answer is \_\_\_.** This will be your lowest common denominator. |
| **Step 3: Multiply each fraction (top and bottom numbers) by the number to make each denominator 6.**$$=\frac{1× }{3× }+\frac{1× }{6× }$$ | **Step 4: Write the numerators (top numbers) over your lowest common denominator and simplify (combine numbers). Reduce your final answer.**$$=\frac{ + }{6}$$$$=\frac{}{6}$$$$=\frac{}{}$$ |

**Try these:**

|  |  |
| --- | --- |
| **a.**  | **b.**  |
| **c**.  \*convert to improper first | **d**:  \*convert to improper first  |

**MULTIPLYING FRACTIONS**

To multiply fractions, simply multiply the numerators and multiply the denominators.

|  |  |
| --- | --- |
| **Ex1**:   | **Ex2**:   |
| **Ex3:**  \* convert to improper fraction | **Ex4:**  \* convert to improper fraction |

**DIVIDING FRACTIONS**

To divide fractions, flip the second fraction upside down then multiply the fractions as above.

|  |  |
| --- | --- |
|  **a.** $\frac{1}{2}÷\frac{8}{3}$$$=\frac{1}{2}×\frac{3}{8}$$$$=\frac{1×3}{2×8}$$$$=\frac{3}{16}$$ | **b**.  \*write 3 over 1 |
| **c.**  \*convert to improper fraction | **d.**  \*convert to improper fraction |

**PRACTICAL PROBLEMS**

**1.** If an electrician works $4^{3}/\_{4}$hours a day on a job at $16 per hour, how much money does she earn in 5 days?

**2.** A department in a factory has three 3/4 - horsepower motors, five 1/4-horsepower motors, six 3 1/3 - horsepower motors and eight 7 1/2 horsepower motors. What is the total connected motor load in horsepower rating?



**3.** If $12^{6}/\_{7}$watts are distributed equally over each of the resistors shown in this figure, find the average number of watts per resistor.

**4.** If 7 1/3 yards of varnished cambric (insulation) cost $22, what is its cost per yard?