natural numbers or counting numbers

whole numbers

\*all natural numbers are whole numbers

integers, positive and negative whole numbers

\*all natural and whole numbers are integers

A **rational number** is any number that can be written in the form , where a and b are integers, and b cannot equal zero. OR  .

A rational number can be written as a:

|  |  |
| --- | --- |
| Form | Examples |
| Fraction | 3, 0, -7, |
| Decimal that terminates or has a repeating pattern | 7.4,, |
| Percent that terminates or has a repeating pattern | 75.3%, % |

\*all natural, whole and integers are rational

Numbers that cannot be written as the ratio of two integers are irrational numbers, . They are non-repeating or non-terminating decimals. eg.

= all rational and irrational numbers together make up the real numbers

How the number systems are all related…

|  |
| --- |
|  |

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

**Reducing Fractions to Lowest Terms**

When using fractions, your solutions must always be given in lowest terms.

In order to reduce a fraction to lowest terms, you have to find the greatest common factor (GCF) of (the greatest number that divides evenly into) the numerator and denominator.

|  |  |
| --- | --- |
| Example 1:  =  The factors of 9 are: { }  The factors of 12 are: { }  The GCF is \_\_\_\_\_\_\_\_\_. Simply divide the numerator and denominator by this number. These two fractions are also known as equivalent fractions. | Example 2:  =    The factors of 27 are { }  The factors of 45 are { }  The GCF is \_\_\_\_\_\_\_\_\_. |

**Try these:**

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

**Converting Mixed Numbers into Improper Fractions**

To convert mixed numbers to improper fractions:  or 

|  |  |
| --- | --- |
| Example 3: | Example 4: |

**Try these:**

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