About Fractions...

What is a fraction?

A fraction is a mathematical way to express part of a whole quantity. A fraction has a numerator and the denominator. The numerator (on top) shows the number of parts of the whole. The denominator (on bottom) shows the number of equal parts the whole is divided by.

What is a least common multiple?

The least common multiple of a group of integers is the smallest number that can be divided evenly by each integer.

How are fractions added together?

Fractions can be added easily two different ways. The first way to to express the fraction as a decimal value, and add the real numbers:

$$1/2 + 1/4 = 0.50 + 0.25 = 0.75$$

Since multiplying by 1.0 doesn't change the value, and any number divided by itself is 1.0, the resulting decimal value can be put into fraction by:

$$0.75 *(100/100) = 75 / 100 = 75/100$$

Dividing both the numerator and the denominator by 25 yields 3/4.

When the denominators of a set of fraction are all the same value, the sum of the fractions is the sum of the numerators divided by the denominator. First find the least common multiple and express the fractions then add the numerators:

$$1/2 + 1/4 = 2/4 + 1/4 = (2+1)/4 = 3/4$$

The Solution...

The lawyer asks a neighbor to bring one extra donkey to Old Jones's herd. The neighbor was a good friend of both Old Jones and the lawyer and gladly agreed to give him a donkey, thinking that this would settle all affairs.

Now Jones's herd had 18 donkeys. The lawyer gave 9 donkeys to the first son. That was "one half of the herd of donkeys." Next the lawyer gave 6 donkeys to the second son. That was "one third of the herd of donkeys." Finally, the lawyer gave one donkey to the third son. That was "one nineth of the herd of donkeys." At last, the lawyer returned the remaining donkey to the bewildered neighbor.

The lawyer was able to solve the problem using the *least common multiple* . The least common multiple is the smallest number into which a set of integers can each be evenly divided.

The original problem called for the following:

$$1/2 + 1/3 + 1/9$$

The least common multiple of {2, 3, 9} is 18. Therefore the problem can be rewritten as:

$$9/18 + 6/18 + 2/18$$

which totalled is 17/18. The lawyer simply needed to add one temporarily to the herd so that donkeys could be regrouped.

References

This puzzle came from my grandfather who swears that it is a true story -- or so he herd.

The Case of the Gummy Bears

The names have been changed to protect the innocent.

You will need to pack:

Two dozen or so gummy bears, goldfish crackers, or other animal marker..

The Case of the Gummy Bears

The Problem:

Once upon a time, in a very small town, there lived a farmer named "Old Jones" who had three sons and a small herd of donkeys.

When he died he left the donkeys to his sons in his will. Here is the will of Old Jones:

> *"To my first son, Albert, I leave one half of the herd of donkeys.*
>
> *To my second son, Brian, I leave one third of the herd of donkeys.*
>
> *To my third son, Carlo, I leave one nineth of the herd of donkeys."*

When Old Jones died he had 17 donkeys. Albert, Brian and Carlo did not get along very well and did not do well in math. It seemed that to divide the 17 donkeys evenly they would have to cut them up which would make them worthless in the fields. So they hired a lawyer to settle the division of the donkeys. Can you figure out how the lawyer was able to evenly divide the donkeys so that all three sons were happy?

Solving The Problem:

Place 17 gummy bears or other markers at Old Jones's Farm. Place more markers at the Campbell's and Smith's. Can you find a way to divide the markers at Old Jones's Farms so that Albert receives 1/2 the herd, Brian receives 1/3 the herd and Carlo receives 1/9 the herd?

Brian's Farm

Carlo's Farm

Smith's Farm (Neighbor)

Albert's Hall

Campbell's Farm (Neighbor)

Old Jones's Farm