Sums. The're Math Magic

2 – Sum Fun With Algebra

Please go through each slide stopping until you have understood the concept described

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An Introduction to Algebra

For those who have not used algebra we need to give a simple explanation.

Algebra uses letters such as a, b, x, and y to represent numbers where we do not know their values.

Suppose I bought two of one item and two of another and spent £7.

However, if I bought only one of item one but two of item two the shopkeeper would have charged me only £5.

So, call the price of item one as "a" and the other "b".

So 2 of a plus 2 of b equals £7

We write this $2a + 2b = 7$

So $a + 2b = 5$

Looking at these two equations:

Equation 1 is $2a + 2b = 7$

Equation 2 is $a + 2b = 5$

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Looking at these two equations:

Equation 1 is $2a + 2b = 7$

Equation 2 is $a + 2b = 5$

If I subtract the same amount from both sides of an equation the resulting equation will also be correct.

So Equation 1 minus Equation 2 becomes:

$2a+2b-a-2b=7 − 5 = 2$

So we get $a = 2$

The price of the first item is £2.

And putting $a = 2$ in Equation 1 we get $2a + 2b = 4 + 2b = 7$

So taking 4 from each side of this equation we get:

$2b = 7 − 4 = 3$

So $b = 1.5$

The price of the second item is £1.50p

That is not too difficult so here are some more examples.

Even Stevens?

I am sure we all know the difference between even and odd numbers, even numbers are exactly divisible by 2 and odd are not.

And you will be aware that:

1.	if we multiply two even numbers the answer is an even number,

	e.g. 4 x 6 = 24 which is an even number.

2.	if we multiply an even and an odd number the answer is always an even number,

	e.g. 4 x 7 = 28 which is an even number.

3.	if we multiply two odd numbers the answer is an odd number,

	e.g. 5 x 7 = 35 which is an odd number.

But how to prove this?

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But how to prove this?

We have to use Algebra – but do not fear, it is quite easy.

We can define an even number as 2a where a is a whole number.

2a is clearly divisible by 2 giving the answer a. Also 2b.

And 2a+1 must be odd as when divided by 2 the answer is (a+½) which means cannot be exactly divided by 2.

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1.   Two even numbers multiplied and produce an even number,

   2a x 2b = 4ab and 4 is divisible by 2,

   So two even numbers multiplied together produce an even number.

2.   An even and an odd number multiplied together produce an even number,

   2a x (2b+1) = 4ab + 2a = 2(2ab+1) which is a multiple of 2,

   Please note the use of brackets "()" to define the number.

3.   Two odd numbers multiplied together produce an odd number,

   (2a+1) x (2b+1) = 4ab+2a+2b+1 = 2(2ab+a+b) + 1,

   This is an even number plus 1 so it must be an odd number.

Please go to the next lesson.

Sum Card Tricks

What is so special about a Maths-Plant?   **It has square roots!**