

Sums. They're Math Magic

22 – Sum More Logic 2

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

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Two Coins In The Piggy Bank



You have two UK coins.

They add up to 70p.

One is not a 20p piece

What are they?



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Two Coins In The Piggy Bank



One is not a 20p piece but the other one is!

A 50p and a 20p.



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Seven Plus Eight

What can you put between 7 and 8 so that the answer is more than 7 but less than 8?

$$7 + 8 = ?$$

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Seven Plus Eight

What can you put between 7 and 8 so that the answer is more than 7 but less than 8?

A decimal point!

$$7 < 7.8 < 8$$

How do you make seven an even number?

Remove the “s”

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Mary's Birthday

Charlie and Oliver have each been told one fact about Mary's birthday.

Charlie has been told the month and Oliver the day.

Mary has given them the following possibilities:

May 15, 16, 19

June 17, 18

July 14, 16

August 14, 15, 17

Charlie says *"I don't know when Mary's birthday is, but I know that Oliver doesn't not know too."*

Oliver thinks and then says *"At first I didn't know when Mary's birthday is, but I know now."*

What is Mary's birthday?

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Mary's Birthday

Tabulating the possible dates.

May		15	16			19
June				17	18	
July	14		16			
August	14	15		17		

The date cannot be May 19 or June 18 as these are the only possible single dates told to Oliver.

If Charlie has been told June and Oliver did not know the month it cannot be June 17 because we have eliminated Jun 18 and Charlie does not know the date. So June is eliminated.

If Oliver had been told 17 there is only one date left, Aug 17, so it is not Aug 17.

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Mary's Birthday

May		15	16			19
June				17	18	
July	14		16			
August	14	15		17		

Oliver then says he now knows the date.

So, because 14 is common to both July and Aug and 15 is common to May and August, Oliver has not been told 14 or 15.

So Oliver was told 16.

Mary's birthday is July 16th.

Why did this king
like fractions?



He is King Henry $\frac{1}{8}$

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Squaring the Number

This is a novel way of finding the square of a two digit number.

Try 47^2 using this method

The next 10 higher is 50 which is 3 higher so we use the 3.

Now go 3 lower = 44

Multiply $44 \times 50 = 2200$

We used 3 so square 3, $3^2 = 9$

Add this to 2200 to get 2209 – the correct answer.

Try it yourself.

Why does this work?

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Squaring the Number

Using the numbers A and B, we need to show that $(10A+B)$ is squared using the method.

	Tens	Units	Calculation
Using $10A + B$	$10A$	B	
Next 10 is (Number X)			$10A+10$
Number X is 10-B higher than $10A+B$			$10-B$
So take 10-B from $10A+B$ (Number Y)			$10A+B-(10-B)$ $=10A-10+2B$

Using $X = 10A + 10$ and $Y = 10A - 10 + 2B$

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Squaring the Number

Using $X = 10A + 10$ and $Y = 10A - 10 + 2B$

Multiply Number X by Number Y:

$$(10A+10) \times (10A-10+2B) = 100A^2-100A+20AB+100A-100+20B$$

Number X: now $(10-B)^2 = 100-10B-10B+B^2 = 100-20B+B^2$

Add these two:

$$100A^2-100A+20AB+100A-100+20B + 100-20B+B^2$$

$$= 100A^2 + 20AB + B^2$$

$$= (10A+B)^2$$

So the method is proven.

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Roman Hands

Two hands are pointing towards the IV
How long until the point to the XII?

Mayday Nursey Rhyme

“Here we go gathering nuts in May”
is a British nursery rhyme

What is wrong?



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Roman Hands

Two hands are pointing towards the IV
How long until the point to the XII?

VII Hours and XL Minutes



until



Mayday Nursey Rhyme

In the UK and the Northern Hemisphere nuts do
not form on trees until September.

So should the song be: “Here we go gathering
nuts in September”?

Unless you are in Australia or New Zealand.

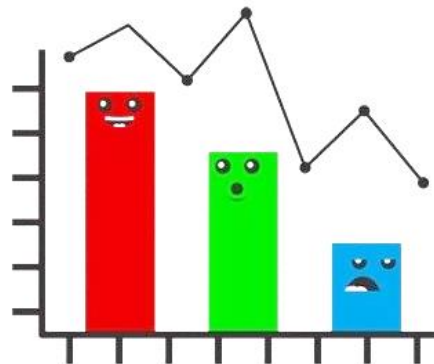
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Please go to the next lesson.

Sum Interesting Sums

I want to be a statistician!



Because it is the art of
always saying you are
90% probably correct!