

Sums. They're Math Magic

6 – Ancient Multiplication

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

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Now let's look at some ancient mathematics.

It is thought that the oldest city on Earth is the Sumarian city of Eridu near the Persian Gulf which existed in about 5000 BC or 7000 years ago.

They wrote in Cuniform script.

However, they had no number system in their language but used “tokens” which represented numbers



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Their “token” system used | for 1, || for 2, ||| for 3, etc.

So multiplication was very difficult, but they could just multiply by 2 and they used this to be able to multiply by any number.

Try multiplying 23 by 17 just using ||| symbols. It is a real problem.



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The Sumerians, and later the Egyptians, did this as follows.

(I am using our decimal notation so you can understand).

Write down under the 17 all the indices of 2 ($2^4, 2^3, 2^2$) ending with 1 and alongside write the 23 doubling for each line:

17	23
16	23
8	46
4	92
2	184
1	368

Now cross out the
numbers not used to
add up to 17

17	23
16	23
8	46
4	92
2	184
1	368

Add up the numbers
not crossed out:

17	391
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I think you may already have noticed that the system is Binary, just the same as we use in computers.

17 is binary 10001 = $1 \times 16 + 0 \times 8 + 0 \times 4 + 0 \times 2 + 1 \times 1$



Why did the student do her maths homework on the floor?

The teacher told her not to use tables.



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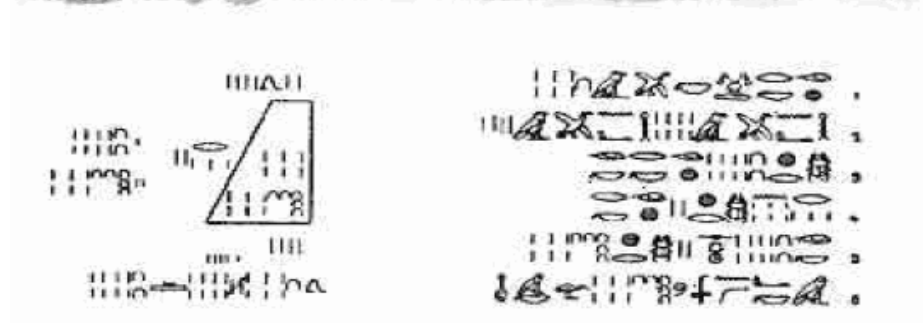
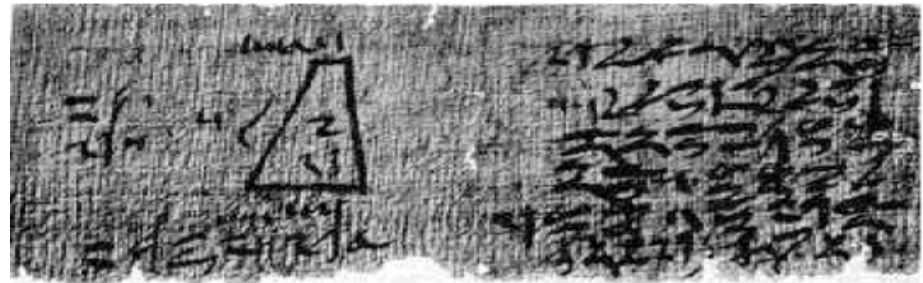
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Moscow Mathematical Papyrus

This is the Moscow Mathematical Papyrus recovered in Egypt as an example of the method of calculating in ancient times.

It contains examples of calculating areas and volumes of triangles, pyramids, spheres, and other shapes.

It is dated to just after 2000BC – about 4000 years ago.



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Peasant Counting

The people in Siberia and the vast desolate areas of Russia had no schools and were mostly illiterate and innumerate (that is they could not spell or do maths).

Sometimes referred to as Russian Counting it is similar to the Sumerian counting system.

In their system you halve the number in the first column and double that in the second.



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In their Siberian system you halve the number in the first column and double that in the second.

17	23	However the peasants did not like fractions so they deleted them.	17	23
8½	46		8½	46
4	92		4	92
2	184		2	184
1	368		1	368

But they also did not like even numbers so delete the rows with these.

17	23
8½	46
4	92
2	184
1	368

Add the remaining numbers

$$17 \times 23 = 391$$

And this is also a binary mechanism.

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Please go to the next lesson.

Sum Problems 2 Solve

I saw my math teacher with a piece
of graph paper yesterday.

I think she must be plotting
something.

