Sums. The're Math Magic

10 – Geometric Sums

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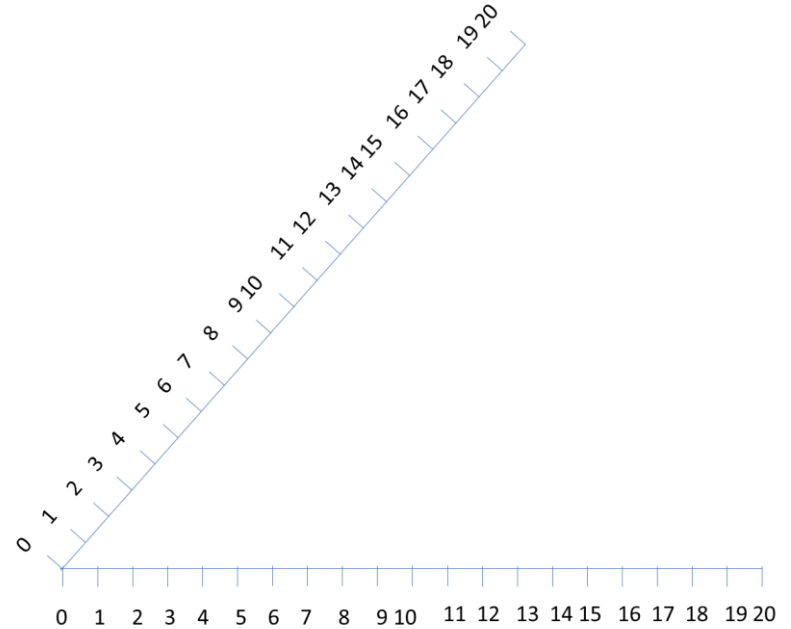
Linear Multiplication

First draw two lines at an angle and mark them with equal graduations and number these.

We can do some multiplications by connecting the points and using parallel lines
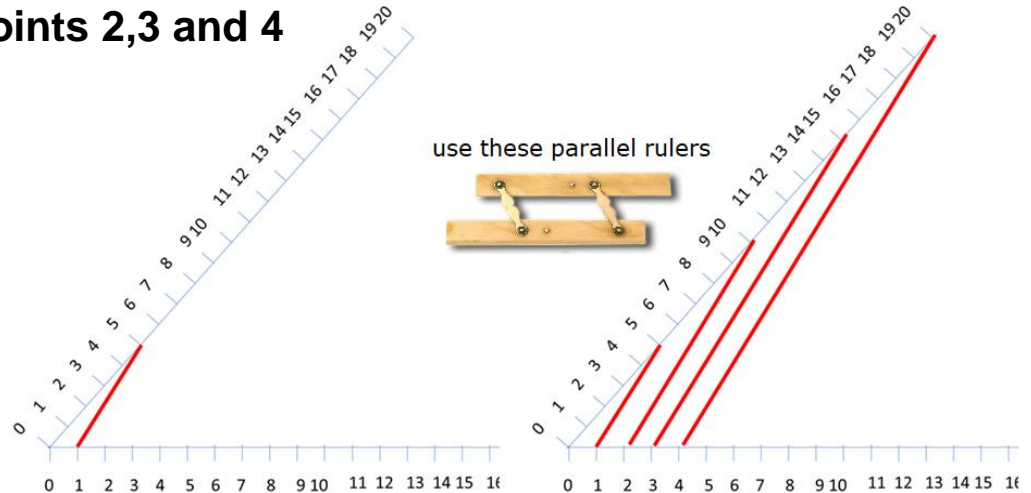
Let's try multiplying 4 by 5

First draw a line connecting 1 and 5.

Then mark the lines parallel from the points 2,3 and 4

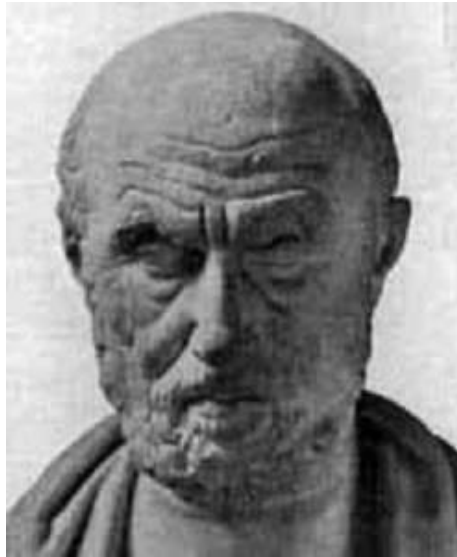**So we have the parallel line through 4 intersects with the angled line at 20**

4 x 5 = 20

use these parallel rulers

This was known to the Greeks and is called Multiplication using the Hippocrates of Chios method.

Free use granted to teachers and school pupils
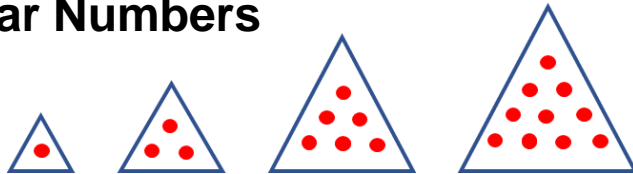
Hippocrates of Chios (470-410 BC)

Hippocrates wrote the first Elements of Geometry which Euclid may have used for his own books more than 100 years later.

He was also the first to show that ratio of the areas of two circles was proportional to the squares of the radii.
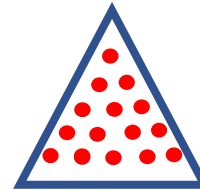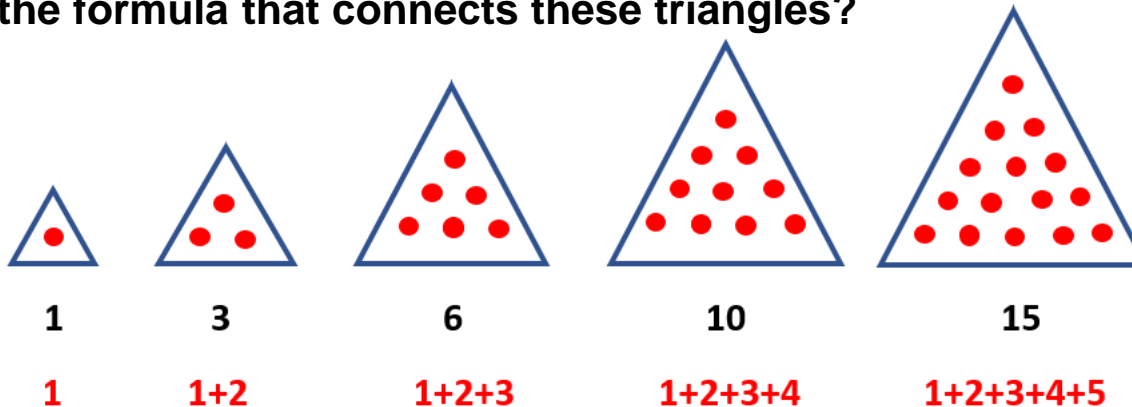
Triangular Numbers

Can you tell which triangle comes next?   It is:

But what is the formula that connects these triangles?

1	3	6	10	15
1	1+2	1+2+3	1+2+3+4	1+2+3+4+5

Please also answer the question "what is the formula for the Nth triangle?"

Free use granted to teachers and school pupils

Start by working out how many dots there are in the tenth triangle.

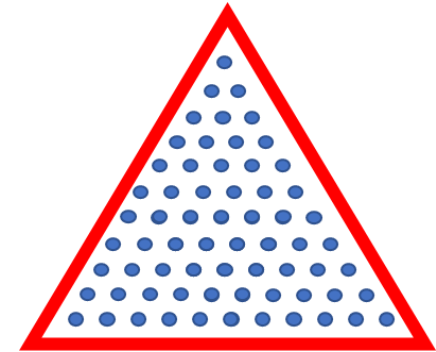**Answer 1+2+3+4+5+6+7+8+9+10**

Combine numbers together in sets of 11

1+10=11, 2+9=11,3+8=11,4+7=11,5+6=11

Adding these we get 11 x (10/2)

Substituting N for 10 we get

Total = (N+1) x ½N = ½N(N+1)

For example, the 11th. triangle would have 5.5 x (11+1) = 66 dots

My Dad had £50 when he went to the shops with Mum.
How much did he have when he came back?

Nothing – Mum had spent it all!

Bear Triangles?

I decide to go on a walk.

I set of by walking 1 KM south

Then 1 KM west

And 1 KM north

And I am back where I started.

I can see a bear

What colour is the bear?

Bear Triangles?
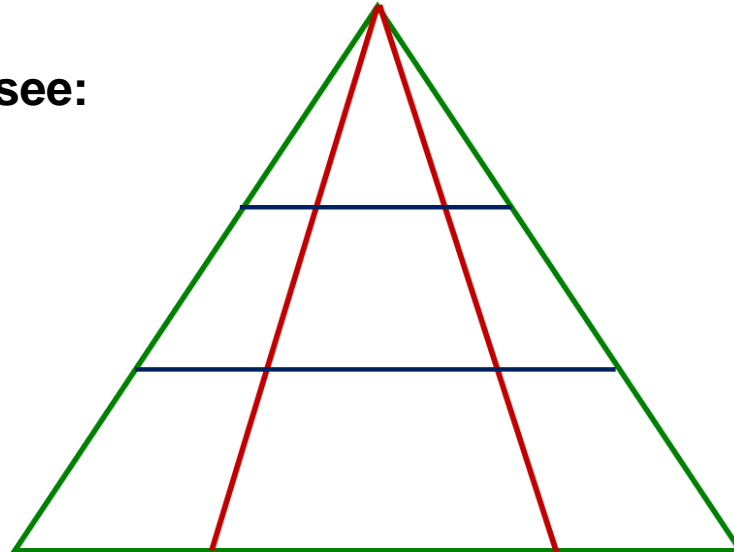
It is a polar bear so it is white

Because you are at the North Pole as this is the only place on Earth that you can walk like that.
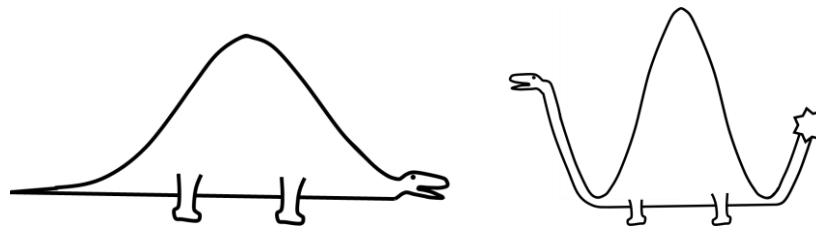
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How many triangles can you see:

Did you hear the one about the statistician?

Probably.

Normalcurviosaurus X meets Sineosaurus Y?

We have identified each area with a number

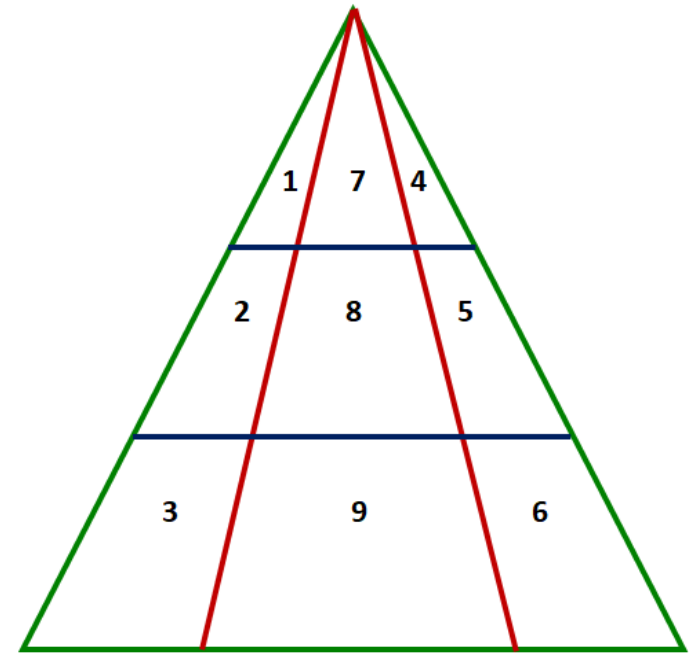There are 18 triangles:

1, 1+2, 1+2+3

4, 4+5, 4+5+6

7, 7+8, 7+8+9

1+7, 1+2+7+8, 1+2+3+7+8+9

4+7, 4+5+7+8, 4+5+6+7+8+9

1+7+4, 1+2+4+5+7+8, 1+2+3+4+5+6+7+8+9

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Please go to the next lesson.

Sum Science