



By Mr Numbervator

MIND BOGGLING MATHS

All numbers are very special, but let me show you the magic of number 11...

Magic NUMBER 11



I showed you how to multiply any number by 11 within seconds.

Let me remind you:

$$11 \times 43 =$$

To get the answer, add together the 4 and the 3 from 43 ($4 + 3 = 7$). Then put the 7 in between the 4 and the 3 (from 43) to get an answer of 473:

$$\begin{array}{r} 11 \times 4 _ 3 \\ 7 \\ \uparrow \\ (4+3) \end{array}$$

$$11 \times 43 = 473$$



I'm number 11's biggest fan!

What if we have the sum 11×91 ? If you add together the 9 and the 1 (from 91) you get an answer of 10. If you put the 10 in between the 9 and the 1, you will get an answer of 9101 which is not the correct answer for 11×91 :

$$\begin{array}{r} 11 \times 9 _ 1 \\ 10 \\ \uparrow \\ (9+1) \end{array}$$

$$11 \times 91 = 9101 \quad \text{X wrong}$$

So here is what you do when the numbers in the sum add up to 10 and above. Add together the 9 and the 1 to get an answer of 10:

$$\begin{array}{r} 11 \times 9 _ 1 \\ 10 \\ \uparrow \\ (9+1) \end{array}$$

Take the 1 from 10 and add it to the 9 to get an answer of 10. The 0 from the 10 goes in the middle as usual and 1 goes on the end.

$$\begin{array}{r} 11 \times 9 _ 1 \\ 10 \\ \uparrow \\ (9+1) \end{array}$$

The answer is 1001!



Try 11×96 using this method.

What about 11×98 ? Add together the 9 and the 8 (from 98) to get 17:

$$\begin{array}{r} 11 \times 9 _ 8 \\ 17 \\ \uparrow \\ (9+8) \end{array}$$

Add together the 1 from 17 to the 9 to make an answer of 10. Put 7 in the middle and 8 on the outside:

$$\begin{array}{r} 11 \times 9 _ 8 \\ 17 \\ \uparrow \downarrow \\ (9+1) \quad (8) \\ 1078 \end{array}$$

So we have an answer of $11 \times 98 = 1078$.



Now you can work out 11×34 , 11×64 , 11×76 and 11×82 without using a calculator!

TERRIBLE THrees

Now I am going to show you something even more amazing — multiplying any 3 digit number (and I mean any 3 digit number!) by 11.

Let's start with:

$$11 \times 345 =$$

Add together the 3 and the 4 to get an answer of 7. Then add together the 4 and the 5 to get an answer of 9. Drop the middle digit (4) then put 7 and 9 in the middle instead to get an answer of 3795:

$$\begin{array}{r} 11 \times 3 _ 5 \\ 7 \ 9 \\ \uparrow \downarrow \\ (3+4) \quad (4+5) \\ 11 \times 345 = 3795 \end{array}$$



I'm Mr Numbervator's biggest fan!