

How to Multiply Two Numbers in The Teens

Here is a neat little trick, and of course, how it works. Let's say I am asked to multiply 17×14 (two numbers in the teens).

I take one of the numbers and add on the unit's digit from the other number. It doesn't matter which number I choose, $17 + 4 = 21$ and $14 + 7 = 21$, I get the same answer either way.

Now I attach a "0" to this answer to get 210.

I multiply the two units digits 4×7 to get 28, and add this on to 210 to get the answer 238.

Let's try it with 18×14 . Add $18 + 4$ or $14 + 8$ to get 22. Attach a zero to get 220. Multiply 4×8 to get 32 and add $220 + 32$ to get 252.

I use this trick quite often, since I watch a lot of overseas rugby on TV. Sometimes the announcers will give a player's weight as 18 "stone". Well a "stone" equals 14 pounds, so I must multiply 18×14 to get 252 pounds to convert to a weight that I understand.

Here is why it works: Let's call the two numbers $1a$ and $1b$, so in the first example above $a = 7$ and $b = 4$.

These numbers are actually, $(10 + a) \times (10 + b)$. If I multiply these binomials out I get $100 + 10a + 10b + ab$.

This can be changed by factoring out a 10 from the first three terms to: $(10 + a + b)10 + ab$.

Now if I change this slightly to: $(10 + a + b)10 + ab$, I see the first bracket as being the first number with the unit's digit from the second number "b" added to it. Then I multiply this bracket by 10 by attaching a "0". To this I add on "ab", which is the product of the two unit's digits.

Now I could also look at the first bracket as: $(10 + a + b) = (10 + b + a)$ which of course is the second number "10 + b" with the unit's digit from the first number "a" added to it. So that is why the first bracket could be either number with the unit's digit of the other number added to it. You get the same answer either way,