

Speciality of the number 9.

Among the set of natural numbers it is always easy for us to do any sort of calculations by 10. But what about 9? 9 is a special number which is also easy for calculations. When adding a 9, we can do it almost mentally by just adding a 10 and then coming back 1. Similarly subtracting a 9 is also simple that we can subtract a 10 and then add a 1.

Today, we are going to see a rule which comes handy finding the product of 9.

The rule is: **the sum of the digits in a multiple of 9 is always 9.**

Simply check any number which is a multiple of 9, say 18, 36, 45, etc. all the numbers will have the digital root to be only 9. Which means the sum of the digits of all the multiples of 9 will be equal to 9.

Also any number which is divisible by 9 will have a digit sum 9. This is nothing but the divisibility property of 9.

Now using the same rule let us see how to get the product of the numbers from 11 to 19 by 9. The product will have 3 digits. According to our rule the sum of the 3 digits will be 9. Keeping this in our mind we can arrive at the answer in 2 steps.

Let us see the steps involved in this multiplication,

- Consider any number between 12 and 19 to be multiplied by 9.
- Subtract 2 from the number.
- This answer will be the first part of the answer.
- Find the sum of the digits of the answer obtained in the first part of the answer.
- As told earlier the last digit should add up with the sum of the first 2 digits to make a total of 9.
- So we can easily find the units digit.

Let us see an example, 14×9

- First step will be $14 - 2 = 12$.
- This is the first part of the answer.
- Out of the 3 digit answer we already have got 2 digits which are 1 and 2.
- Sum of these 2 digits is $1 + 2 = 3$
- Next is that the sum of the 3 digits should be 9.
- So 3 added to 6 only will be 9 so the unit's digit will be 6.
- Hence the answer is 126.

Let us see some more examples;

$16 \times 9 =$

Step 1: $16 - 2 = \mathbf{14}$. (First part of the answer)

Step 2: $1+4 = 5$ (sum of the digits obtained)

Step 3: $5 + \mathbf{4} = 9$ (to make a total of 9)

Answer is $16 \times 9 = 144$.

$19 \times 9 =$

Step 1: $19 - 2 = \mathbf{17}$.

Step 2: $1+ 7 = 8$

Step 3: $8 + \mathbf{1} = 9$

Answer is $19 \times 9 = 171$.

So in this method we are not actually multiplying. We are simply using the digital sum to get the answer, but remember it is only for the numbers between 12 and 19. And we can go for higher numbers in our next article.

Now you can try, 13×9

$$18 \times 9$$

$$15 \times 9$$