

## Ancient Egyptian multiplication

<https://circles.math.ucla.edu/circles/lib/data/Handout-955-1019.pdf>

[https://en.wikipedia.org/wiki/Ancient\\_Egyptian\\_multiplication](https://en.wikipedia.org/wiki/Ancient_Egyptian_multiplication)

Beginners Circle 11/9 /2014

Ancient Egyptians had an interesting method for multiplying two numbers. Suppose that you have to multiply two numbers (eg 23 and 18). The basic operation for them was multiplying a number by 2. (In other words, adding a number to itself.) They reduced all other multiplication problems to it. Here is how they would start multiplying 23 by 18 (in modern notation).

23	18
—	—
1	18
2	36
4	72
8	144
16	288

Here is what they did to complete the multiplication.

1. Beneath the first number (in this case 23), they would write all of the powers of 2 that are smaller than or equal to the first number.
2. In the second column, they would keep doubling the second number (in this case 18)
3. After that, they would represent the first number as the sum of the powers of 2 (so that each of the powers of 2 is used at most once).

For example, if the first number is 23 they would find

$$23 = 16 + 4 + 2 + 1$$

After that, they would mark those rows where these powers of 2 are present in the left column. (In this example, the first, second, third, and fifth rows are marked.)

4. Finally all there is to do is to add the marked numbers in the second column to obtain the answer (which may easily be verified by pocket calculator).

$$18 + 36 + 72 + 288 = 414$$