



fun with NUMBERS



Multiplication, using lines, dots, and intersections ...

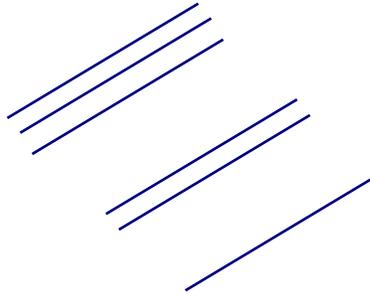
- General Rules: ① numerical digits are in *units, tens, hundreds* and *thousands* for the number's overall value; ② lines, representing a number's value, are one of three colors (i.e., red: 0, blue: 1, black: 5) lines representing "1" and "5" are solid lines; line representing "0" is dashed; ③ lines in a group represent their respective digit (i.e., red lines are 0x; blue lines are 1x; and black lines are 5x the line(s) that they intersect in their group range); ④ the number of intersecting lines in a zone region retains the unit number and carries any tens number; and ⑤ zone regions are for: *units, tens, hundreds* and *thousands*.

$$321 \times 12 = 3,852$$

let's begin ... each digit in the number **321** is represented by the line(s) shown here below ...

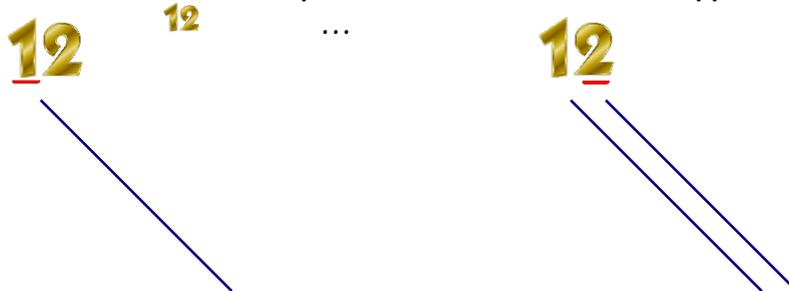


the final result for the number **321**, with each digit represented by lines, would look like this:



Step 1:

next ... are digits in the number **12**, also represented by lines, but in the opposite direction



Step 2:

Step 3:

now the combined line pattern looks like this:

and dots will create the final result ... they're placed where each of the lines intersect ...

Step 4:

next we need to identify the zones regions for the *units tens hundred and thousands*

Step 5:

arriving at the final result ... add each of the intersecting dots, for each zone's region ...

3 thousands (3)
8 hundreds (6 + 2)
5 tens (4 + 1)
2 units (2)

AWESOME! **WOW!** **AMAZING!**

Step 6:

what if the dots, in the intersecting lines for a region, are greater than ten ... 33×33

$$\begin{array}{r} 33 \\ \times 33 \\ \hline 99 \\ 99 \\ \hline 1,089 \end{array}$$

Step 7:

what if one of the digits in the multiplication equation is a zero (e.g., "102") ... 102×33

$$\begin{array}{r} 102 \\ \times 33 \\ \hline 306 \\ 306 \\ \hline 3,366 \end{array}$$

Step 8:

what if one of the digits in the multiplication equation is a five (e.g., "252") ... 252×33

$$\begin{array}{r} 252 \\ \times 33 \\ \hline 756 \\ 756 \\ \hline 8,316 \end{array}$$

the green line is 5x the line(s) that it intersects ... in the case above its 5x three line (15).