Wonders of natural integers

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Abstract

In this paper I highlight the wonders of natural integers. I discovered pairs of integers which, by doing operations on them, I find relationships between the parts of these numbers. I put this work in the hands of young researchers for deepening, this in the interest of science and knowledge.

Wonders of natural integers

Let be the following pairs of integers:

$(3;67),(7;43),(9;89),(11;91),(13;77),(17;53),(19;79),(29;81),(23;87)$
$(27;63),(29;69),(31;71),(33;97),(37;73),(39;59),(41;61),(47;83)$
$(49;49),(51;51),(57;93),(99;99)$

1.1: if we perform operations between these numbers, we always obtain that the number consisting of the last two digits is a multiple of the other part

1.2: Example

$7*43*17 = 5117 \rightarrow 51 = 3*17$
$53*17*29 = 26129 \rightarrow 261 = 9*29$
$53*17*47 = 42347 \rightarrow 423 = 9*47$

$7*143*17 = 17017 \rightarrow 170 = 10*17$
$53*217*29 = 333529 \rightarrow 3335 = 115*29$
$353*17*47 = 282047 \rightarrow 2820 = 60*47$
$(3*67)(7*43)(9*89)*37 = 1793068137 \rightarrow 17930681 = 484613*37$

$3*67 + 7*43 = 8534 \rightarrow 34 = 2*17$
$(3*67 + 7*43 + 9*89)17 = 22151 \rightarrow 51 = 3*17 \rightarrow 221 = 13*17$
$(3*67 + 7*43 + 9*89 + 63)19 = 57076 \rightarrow 570 = 30*19 \rightarrow 76 = 4*19$
$(3*67 + 7*43)29 = 23258 \rightarrow 232 = 8*29 \rightarrow 58 = 2*29$
$(103*267)29 = 797529 \rightarrow 7975 = 275*29$

1.3: Example

$353*217*37 = 2834237 \rightarrow 28342 = 766*37$
$(3*67)(7*43)*29 = 175429 \rightarrow 17545 = 605*29$
$3*67*167 = 33567 \rightarrow 335 = 5*67$
$3*67*267 = 53667 \rightarrow 536 = 8*67$
$17*53*253 = 227953 \rightarrow 2279 = 43*53$

2.1: if we perform operations between these numbers, we always obtain that the number consisting of the last three digits is a multiple of the other part

2.2 Example:

$$69*29*347 = 694347 \rightarrow 694 = 2*347$$
$$69*729*347 = 17454447 \rightarrow 174541 = 503*347$$
$$(17*353)(53*717)237 = 54046428237 \rightarrow 54046428 = 228044*237$$
$$(17*353)(53*717)437 = 99655228437 \rightarrow 99655228 = 228044*437$$

3.1: if we perform operations between these numbers, we always obtain that the number consisting of the last three digits is a multiple of the other part

if we perform operations between these numbers, we always obtain that the number consisting of the last four digits is a multiple of the other part

3.2: example

$$17*2353*1259 = 50361259 \rightarrow 50306 = 4*1259$$
$$53*4717*1259 = 314751259 \rightarrow 31475 = 25*1259$$
$$17*1579*1259 = 37771259 \rightarrow 3777 = 3*1259$$

3.3: Now if we take the two numbers of a couple and we raise them to powers, we find 02 as the last number

$$3^4 + 67^4 = 20151202$$
$$3^8 + 67^8 = 406067677563202$$
$$91^4 + 11^4 = 68589602$$
$$91^8 + 11^8 = 470252549050402$$
$$29^4 + 69^4 = 23374402$$
$$3^4 + 167^4 = 777796402$$
$$3^4 + 267^4 = 5082121602......etc$$