

## Answer on Question #83741 – Math – Combinatorics | Number Theory

### Question

$$7 \times \text{TUSHER} = 6 \times \text{HERTUS}$$

every alphabet here will be a number

For Further information:

$$\text{T/U/S/H/E/R} = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9$$

SOLVE THE EQUATION ABOVE.

### Solution

Denote  $HER = a$ ,  $TUS = b$ . These are two 3-digit numbers.

Then

$$\text{TUSHER} = 1000b + a, \quad \text{HERTUS} = 1000a + b$$

We have

$$7(1000b + a) = 6(1000a + b)$$

from which

$$5993a = 6994b$$

or

$$461a = 538b$$

Since 461 and 538 are mutually prime numbers,  $a$  should be divisible by 538. The only 3-digit number divisible by 538 is 538. So  $a = 538$ , from which  $b = 461$ .

Hence the answer is  $H = 5, E = 3, R = 8, T = 4, U = 6, S = 1$ .

**Answer:**  $H = 5, E = 3, R = 8, T = 4, U = 6, S = 1$ .