

October 5, 2018

HW task 1:

Three ex-teenagers find that the product of their ages is 17710. What is the sum of their ages?

HW task 2:

Read (carefully) the following passages.

Passage 1:

Fundamental Theorem of Arithmetic:

Every natural number n , $n > 1$, has a unique (except for the order of factors) decomposition into prime numbers:

$n = p_1^{e_1} \cdot p_2^{e_2} \cdot p_3^{e_3} \cdot \dots \cdot p_k^{e_k}$ where $p_1, p_2, p_3, \dots, p_k$ are different prime numbers and $e_1, e_2, e_3, \dots, e_k$ are natural numbers.

Question: Can we use this to explain the status of 1?

Passage 2:

Greatest Common Divisor/Factor - GCD/GCF

We denote the greatest common divisor of numbers a and b by $\gcd(a, b)$.

To find $\gcd(a, b)$ we decompose both a and b into prime factors. Then we determine common prime factors and calculate the product of lowest powers of prime factors occurring in both a and b .

Example: Find the $\gcd(35, 49)$

$$35 = 5 \cdot 7, \quad 49 = 7^2; \quad \gcd(35, 49) = 7$$

Passage 3:

To determine $\text{lcm}(a, b)$, decompose both a, b into their PNDs. Then calculate the product of all prime factors from either (at least one) decomposition, taking factors to the highest exponent occurring.

example: $\text{lcm}(35, 49) = 5^1 \cdot 7^2 = 245$

HW task 3:

What is the difference between lcm and \gcd of the three numbers: 5, 10 and 35?

HW task 4:

Prove that the line $32x + 48y = 105$ contains no lattice points.