

Prime Factorization-1: Right or Wrong

GCD – greatest common divisor, LCM – least common multiple, a, b, c, d, n – positive integers. A *perfect square* is a square of a positive integer (e.g 4, 49, 100).

1. n is divisible both by 74 and by 18. Does that imply **a)** n is divisible by 111? **b)** $n > 1000$?
2. **a)** Can $\text{LCM}(a, b) < \text{GCD}(a, b)$? **b)** Can $\text{LCM}(a, b) = \text{GCD}(a, b)^2$?
3. Given integers a, b, c such that $a = b^2$ and $a = c^3$. Does that imply there exist an integer d such that $a = d^6$?
4. Let a, b, c positive integers such that GCD of any two of them is greater than 1. Can $\text{GCD}(a, b, c) = 1$?
5. **a)** Can the product of two consecutive positive integers be divisible by 100 if both integers are less than 100?
b) Can the product of two consecutive positive integers be divisible by 1000 if both integers are less than 1000?
6. $\text{LCM}(a, b) = ab$. Can $a < \text{GCD}(a, b) < b$?
7. **a)** The product ab is a perfect square. Does that imply both a and b be perfect squares?
b) The product of two coprime numbers is a perfect square. Does that imply both numbers be perfect squares?

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