Numerical Oddities of December 21, 2012—Ending Date of the Long Count Mayan Calendar

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Based on the existing literature, there is general consensus that the completion of the 13-baktun cycle Long Count Mayan calendar is to occur 366 days from today, on Friday, December 21, 2012. Because so many arguments, stories and predictions have already been published and reported by the news media regarding this "mystery" calendar day, I recently decided to investigate the numerical properties of this date number just for fun. Although my research goal was purely recreational (like a brainteaser math puzzler), I have to admit that at the back of my mind I was also curious, and hopeful I would stumble onto something about this day that would distinguish it from other calendar days. I am happy to report to you that based on my findings I am convinced that this calendar date indeed possesses unique properties which make it a special one:

- First of all, December 21st expressed as 12-21 or simply 1221 equals 11 x 111; that is, the product of two "repunit" numbers! (Note that 2011 contained four repunit calendar dates: 1-1-11, 1-11-11, 11-1-11, and 11-11-11.) Second, today's full date expressed as a single number in day-month-year date format as 21122011 equals 11111 x 1901 (where 11111 is a repunit), where 1901 is 111 years away from 2012 in which the 13-baktun cycle Long Count Mayan calendar will come to an end. Third, 1901 is the 291st prime number where interestingly enough, reverse of 291 (which is 192) multiplied with repunit 11 yields 11 x 192 = 2112, which represents 21st December! Fourth, note that 192 = 2 x 96 where 96 represents the 96th prime number which is 503 and four times 503 yields 2012! Fifth, numbers 11111 and 1901 differ by 9210 which equals 2 x 3 x 5 x 307 where 307 can be interpreted as (305 + 2); note that the reverse of 305 and 2 are the prime factors of 2012 (since 2012 = 2 x 2 x 503)!
- Note also that the reverse of today's full date 21122011 written as 11022112 is also divisible by repunit 11111!
- Next, we focus on December 21, 2012 expressed in the month-day-year date format as 12212012. If this date number is split as 12, 21, 20, and 12, the sum of the first two is 33 and the last two add-up to 32. Twice the product of these two numbers results in 2 x 33 x 32 = 2112! It is like magic, isn't it?
- Also, the sum of the digits of calendar day 21122012 or 12212012 is 11 (repunit)!
- Next is a bit of a stretch but very interesting coincidence: Note that 21122012 = 2 x 2 x 5280503 where 5280503 happen to be the 366653rd prime number. The reverse of number 366653 is 356663 which happens to be the 30500th prime number. Now, if 30500 is expressed as the product of numbers 305 and 100, both of these numbers tie back to the Long Count ending day 21122012. Here's how: Number 305 corresponds to the reverse of one-fourth of 2012 and 100 is simply the difference between 2112 and 2012 (which are the leftmost and the rightmost four digits of 21122012). This is indeed a fascinating coincidence! Also, if number 356663 is split as 356 and 663, these two numbers differ by 307 which can be interpreted as (305 + 2), where the reverses of these two numbers are the prime factors of 2012!
- Also, it's interesting to note that 12212012 (or 21122012) consist of four two-digit numbers 21, 12, 20, 12 put side by side. Among these four, except for 20, the other three numbers are either 12 or its reverse (21). However, number 20 can also be interpreted as 21 since any year number (except 2100) in the 21st century start with 20! So, for this reason, one can interpret date number 12212012 as being made of numbers 12 and 21 (which is 12 reverse). Note that 1 baktun in the Long Count Mayan calendar corresponds to 144 x 1000 days where 144 = 12 x 12!
- Note also that the leftmost and rightmost halves of today's date expressed in the day-month-year format as 21122011 differ by 2112 – 2011 = 101 and 101 and 2011 are the 26th and 305th prime numbers. Interestingly enough, half of 26 equal 13 (which represent 13 baktuns) and four times reverse of 305 yields 2012! Also, the reverses of numbers 26 and 305 differ by 441, that is, 21 x 21!
- Also, as an aside, 2011 and 2012 are not only two consecutive years but there exists a very interesting "hidden" numerical connection between them: 2011 is the 305th prime year and the reverse of 305 which is 503 times 4 yields 2012! This connection is very rare and unique! Interestingly enough note also that the 305th prime year (2011) coincided with Benjamin Franklin's 305th birthday!