

The 236th Birthday of America Possesses "Magical" Prime Powers

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Wednesday, July 4th, 2012 marks the 236th anniversary of the US Independence Day. The United States of America officially declared its independence from the British Empire 236 years ago on July 4th, 1776.

As I was looking into date numbers related to Independence Day, I stumbled onto something unique that convinced me that this (236th) anniversary possesses some "magical" prime powers. How? I will explain.

Number 236 equals $2^2 \times 59$, that is, its prime factors are 2 and 59. 59 is the 17th prime number which equals $59 = 17 + 19 + 23$, i.e., the sum of three consecutive (7th, 8th and 9th) prime numbers. Also, $2 + 59 = 61$, another prime and the 61st prime number equal 283. Note that all of these primes are simply derived from this year's Independence Day anniversary number 236.

236th Birthday is Magical!
Prime factors of 236 are 2 & 59.
 $59 = 17 + 19 + 23.$
 $2 + 59 = 61 \rightarrow$ 61st prime is 283.
Multiply primes 17, 19, 23 and
283 and read backwards:
 $17 \times 19 \times 23 \times 283 = 2102407!$

1. Just for curiosity, I went ahead and multiplied primes 17, 19, 23 and 283 and I couldn't believe what I found: $17 \times 19 \times 23 \times 283 = 2102407!$ Do you recognize this number? (Hint: Read it backwards and interpret it as a calendar date!) This result indicates that the full date number of this year's US Independence Day is cryptically coded in its anniversary number. Does this make sense?
2. Next, put numbers 7, 8 and 9 (corresponding to primes 17, 19 and 23) side-by-side to make-up the number 789. Then, add 789 with its reverse (987). What comes out? (1776!) Wow! (Note that interestingly enough, if primes 59, 2 and 2 (the product of which yields 236) are put side-by-side as 5922, one-sixth of this number equal 987.)
3. Third, divide the full date number of the 236th anniversary July 4th, 2012 expressed as 7042012 by prime 17: $7042012 \div 17 = 414236$. What do you see? (Hint: Focus on the rightmost three digits.) It is like magic, isn't it?
4. Next, split number 414236 in the middle as 414 and 236 and multiply these two numbers: $414 \times 236 = 97704$. What do the rightmost three digits of the result represent? (July 4th!)
5. Let us now divide the full date number 7042012 by prime 17 and multiply the result by six (six being the difference of the digits of prime 17): $7042012 \div 17 \times 6 = 742026$. Do you recognize this date? (Hint: The full date of the 250th anniversary of the US Independence Day.)
6. The product of the prime factors of 236 is $2 \times 59 = 118$ and 118 can be expressed as the sum of four primes: $118 = 7 + 23 + 41 + 47$. Interestingly enough, the product of these four prime numbers yields $7 \times 23 \times 41 \times 47 = 310247!$ (Hint: Read it backwards!) So, the full date number of next year's US Independence Day is also cryptically coded in number 236! Fascinating!

7. Note that 7, 23, 41 and 47 are the 4th, 9th, 13th and 15th prime numbers. Numbers 15, 13, 9 and 4 (corresponding to primes 47, 41, 23 and 7) put side-by-side yield 151394 which equals $151394 = 2 \times 59 \times 1283$, where 283 (rightmost three digits of 1283) corresponds to the 61st prime (where again, $61 = 2 + 59$, the sum of the prime factors of 236). Another hidden connection, agreed?
8. Interestingly enough, the 236th prime number is 1487. Also, if number 59 is reversed yielding 95, the 95th prime number is 499. The product of primes 1487 and 499 yields: $1487 \times 499 = 742013!$ (Next year's Independence Day!) Unbelievable!
9. If number 236 is split as 2, 3 and 6 (where 2 and 3 are the prime factors of 6), note that $6^{(2+3)}$ (that is, six to the power the sum of its prime factors) yields 7776, that is, the 6000th anniversary year of the US Independence Day!
10. Lastly, note that this year, 2012, is a leap year and so was 1776. 2012 marks the 57th leap-year anniversary of Independence Day where 57 equal the difference of 2 and 59, the prime factors of 236. In addition, July 4th is the 186th day of each leap year. Interestingly enough, 186 equals twice the sum of numbers 17 and 76, which together side-by-side constitutes 1776. The difference of the reverses of primes 2 and 59 also equal $(17+76)$. Also, prime 59 equals the difference of 17 and 76! Also, 1776 equals to three times 592, a number consisting of primes 59 and 2 put side-by-side.

Based on the above I hope I was able to convince you about why the 236th anniversary of US Independence Day possesses "magical" prime powers. Happy 236th Fourth of July Birthday America!

Note: Benjamin Franklin's birth date of January 17th is also cryptically coded in number 236. How? It turns out primes 2 and 59 (which are the prime factors of 236) happen to be the 1st and the 17th prime numbers. Interestingly enough numbers 1 and 17 put together side-by-side yields 117, representing January 17. Note also that in July 1776, Franklin was the oldest signer of the Declaration of Independence at age 70 where 70 equals the difference of the reverses of numbers 1 and 17.

Note: Other July 4th Independence Day anniversaries found by Inan that are numerically noteworthy are as follows:

- Independence Day July 4th, 1776, expressed as 7041776 is unique because if this number is split as 704 and 1776, $704 = 4 \times 4 \times 44$ and $1776 = 4 \times 444!$
- Independence Day July 4th, 1776, expressed as 741776 equals $56 \times 74 \times 179$, where 74 represents July 4th, 56 corresponds to the total number of delegates who signed the Declaration of Independence document, and 179 is the sum of the reverses of numbers 56, 74 and 76, where 76 is the rightmost two digits of 1776 (179 also equals one-half of the reverse of one-half of Franklin's birth year 1706 and one-tenth of his death year 1790).
- The 64th anniversary that occurred on 7041840 is special since this date number is divisible by both 1776 and its reverse (6771).
- The 235th anniversary date 7042011 minus one is divisible by anniversary number 235.
- The 237th anniversary to occur in 2013 is interesting since $2013 = 3 \times 11 \times 61$ where prime 61 minus the sum of primes 3 and 11 yield the reverse of 74 (July 4th).
- The 238th anniversary to occur in 2014 is special since the prime factors of 2014 which are 2, 19, and 53 add-up to 74 (representing July 4th).
- The 242nd anniversary in 2018 is also special since $242 = 23 + 37 + 73 + 109$ where the product of these four primes yield $23 \times 37 \times 73 \times 109 = 6771407$ (read backwards)!
- The 259th anniversary to occur on 7042035 is numerically noteworthy for three reasons: First, 7042035 is divisible by five consecutive primes since it equals $3 \times 5 \times 7^2 \times 11 \times 13 \times 67$.

- Second, 2035 is five times reverse of 704 (July 4). Third, 2035 divided by the sum of 20 and 35 (which make-up 2035) is 74 (representing July 4th).
- The 270th anniversary to occur in 2046 is special since the prime factors of 2046 (2, 3, 11 and 31) add-up to the reverse of 74 (July 4th).
 - The 272nd anniversary to occur on 7042048 is unique because if split as 704 and 2048, $704 = 2^5 \times 22$ and 2048 is 2^{11} . In addition, 272 (which equal approximately $100e$ where e is Euler's number) can be expressed using eleven 2's as $272 = 2^4 \times (2^4 + 2^{2-2})$.
 - The 278th anniversary to occur in 2054 special since 20 and 54 (which make-up 2054) add-up to 74 (July 4th).
 - The 314th anniversary to occur in 2090 is interesting since 314 approximately equal to one-hundred times pi.
 - The 327th anniversary to occur in 2103 is special since the prime factors of 2103 (3 and 701) add-up to 704 (July 4th).
 - The 336th anniversary to occur in 2112 is unique since 2112 is three times 704 (representing July 4th) as well as one-third of 336 matches the rightmost three digits of 2112.
 - The 352nd anniversary to occur in 2128 is special because twice 352 equal 704 (July 4th).
 - The 377th Fibonacci anniversary to occur in 2153 is interesting since 21 plus 53 (which make-up 2153) yields 74 (July 4th). Also, 2153 is the 325th prime number and 21 square plus 53 square equals to 3250 which is ten times 325.
 - The 407th anniversary to occur in 2183 is unique since not only 407 is reverse of 704 (July 4th) but it also equals the sum of the cubes of the digits of 704.
 - The 444th anniversary to occur in 2220 is special since four times 444 equal 1776.
 - The 446th anniversary in 2222 is interesting since 2222 equals twice the sum of 704 (July 4) and its reverse (407).
 - The 592nd anniversary to occur in 2368 is special because 7042368 is divisible by 1706 (Franklin's birth year) and 742368 (corresponding to the same calendar date) is divisible by 1776.
 - The 631st anniversary date 7042407 is a palindrome day.
 - The 808th anniversary in 2584 is also interesting since 2584 is twice the product of the leftmost and rightmost two digits of 1776.
 - The 888th anniversary to occur in 2664 is special since 2664 equals three times 888 and twice 888 equals 1776. Also, 2664 is divisible by 74 (July 4th).
 - The 908th anniversary to occur on 7042684 is unique since 704 equals 16 times 44 and 2684 is 61 times 44.

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