

### **Numerically Special Calendar Dates of 2012 in Month-Day-Year Date Format**

(Aziz S. Inan, Ph.D., Professor, Electrical Engineering, University of Portland, Portland, Oregon)  
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Today at midnight, we will say farewell to 2011 and welcome its next consecutive counterpart, 2012. Note that these two years are not only consecutive but there exists another unique numerical connection which couples them further. This connection is based on the fact that 2011 is a prime-year since 2011 is the 305th prime number. (As an aside, the last prime year before 2011 was 2003 and the next will be 2017.) Interestingly enough, four times the reverse of number 305 (which is 503) yields 2012. Isn't that something? It's like a "secretly-coded" connection!

As we are about to enter the new year, I decided to research some of the full calendar dates of 2012 to see if I can identify some that possess unique numerical properties. Note that my investigation is solely recreational--just for fun. I am happy to report that 2012 indeed contains several date numbers which are numerically special. My hope is that these findings will get the attention of people who do math puzzles and others who have curiosity about and interest in numerically special calendar dates, birthdays, anniversary dates, historical dates, etc. In addition, number nerds like me would with no question love to find out another number with a rare numerical property. Also, the results of my report may serve as a vehicle to get some young people and even adults more interested in numbers and mathematics.

The following is a list of the results of my investigation that I hope you will enjoy reading and sharing:

- First of all, note that 2012 is the 12th year of the 21st century!
- Second, all calendar date numbers in 2012 expressed in both month-day-year and day-month-year date formats are divisible by four since the year number ends with 12!
- Third, January 9th (1-09) and October 9th (10-9) in 2012 expressed as a single full date number 1092012 is divisible by 901 which is the reverse of 109 since  $1092012 = 901 \times 1212$ !
- Fourth, 2012 contains one seven-digit palindrome day to occur on the 10th of February expressed as 2102012! In addition, if each date number is expressed using only the rightmost two digits of the year number (12), there exists one four-digit palindrome date given by 2-1-12 (February 1st) and ten five-digit palindrome dates all to occur in February ranging between 2-10-12 (or simply 21012, which represents February 10th, 2012) and 2-19-12 (February 19th), including 2-14-12 (Valentine's Day). So, 2012 will have a palindrome Valentine's Day!
- If February 22nd, 2012 date is expressed as 2222012, this number equals  $2 \times 2 \times 13 \times 13 \times 19 \times 173$  and these prime numbers add up to 222, that is, February 22nd!
- 2012 is a leap year, the third to occur in this (21st) century. February 29th, 2012 will be the third leap day of the third millennium!
- March 5th, 2012 expressed as 3052012 is an interesting date number because if it's split as 305 and 2012, the reverse of one-fourth of 2012 equals 305!
- Similarly, March 21, 2012 expressed as 3212012 equals  $2 \times 2 \times 53 \times 109 \times 139$  where these prime numbers add up to 305, which is, again, the reverse of one-fourth of 2012!
- May 3rd, 2012 is another interesting date number for two reasons: If expressed as 5032012, 503 is one-fourth of 2012! (Note that date number 5032012 is divisible by 2012.) On the other hand, if expressed as 532012, it equals the product of two palindrome numbers as  $532012 = 676 \times 787$  where the second palindrome can be obtained from the first by incrementing each of its digits by one!
- The full date number of July 28, 2011 expressed as 7282012 equals  $4 \times 251 \times 7253$ . Interestingly enough, four plus the reverse of the difference of the two prime factors 7253 and 251 result in year 2011!
- September 19th (that is, 919, a palindrome number), 2012 written as 9192012 can be expressed as the product of its prime factors in the following order:  $9192012 = 2 \times 337 \times 2273 \times 3 \times 2$ , where removing all the multiplication signs result in a ten-digit palindrome number 2337227332!
- October 6th, 2012 expressed as 10062012 is also divisible by 2012 since  $10062012 = 5001 \times 2012$ !
- If each date number is expressed using only the rightmost two digits of the year number (12), October 11, 2012 expressed as 10-11-12 consists of three consecutive prime numbers!

- November 19, 2012 written as  $11192012 = 2 \times 2 \times 13 \times 101 \times 2131$ . Interestingly enough, subtracting the first four prime numbers from 2131 yields next year 2013!
- Again, if the year number is expressed by using only its rightmost two digits, December 12, 2012 expressed as 12-12-12 is a unique date since its month, day and year numbers are all equal! (Note that this is the last such date to occur in this century.)
- Of course, the "mysterious" ending date of the Long Count Mayan Calendar is also to occur this year on December 21, 2012. I found interesting unique numerical properties related to this calendar date which I reported in the second document posted on my personal website on December 21, 2012.