

## Dozen Numerical Brainteasers to Welcome Pope Francis to the United States

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Pope Francis (born with birth name Jorge Mario Bergoglio, on 17 December 1936, in Buenos Aires, Argentina) is scheduled to visit the United States this week. As a welcome gift for him, I constructed the following dozen numerical brainteasers and I hope that he will have fun reading them:

1. Pope Francis was elected as the 266<sup>th</sup> pope of the Catholic Church on 13 March 2013. Note that half of 266 equal 133 and interestingly enough, 133 in day-month date format represents 13-3 (13 March), the day when Pope Francis became the pope. In addition, the product of the digits of 266 yields  $2 \times 6 \times 6 = 72$  and guess what, the 72<sup>nd</sup> day of 2013 is also 13 March! Wow!
2. Pope Francis was born on the 352<sup>nd</sup> day of 1936, which is 17 December 1936, or 17-12-1936. Interestingly enough, the sum of the digits of his birth date yields  $1 + 7 + 1 + 2 + 1 + 9 + 3 + 6 = 30$  which equals  $3 \times 5 \times 2$ , that is, the product of the digits of 352.
3. Pope Francis was born in 1936, which equals the square of palindrome number 44. In addition, he turned into palindrome ages 55 and 66 in palindrome years 1991 and 2002. He also turned into palindrome ages 11, 22, 33, 44 and 77 in years 1947, 1958, 1969, 1980, and 2013, where if each of these year numbers are split in the middle, the sum of the left- and right-sides of each yield palindromes 66, 77, 88, 99, and 33, respectively. (Also, 20 and 02, which make up 2002, add up to 22.) Similarly, Pope Francis's 88<sup>th</sup>, 99<sup>th</sup> and 121<sup>st</sup> palindrome-number birthdays will occur in years 2024, 2035 and 2057, where again,  $20 + 24 = 44$ ,  $20 + 35 = 55$  and  $20 + 57 = 77$ .
4. The next palindrome year 2112 will mark Pope Francis's 176<sup>th</sup> birthday, where 176 equals twice palindrome number 88. In addition, twice 176 is 352, when again, 352<sup>nd</sup> day of 2112 will be Pope Francis's birthday, 17-12-2112. Also, 2112 divided by the sum of its digits is 352.
5. The digits of Pope Francis's birth date 17-12 add up to 11, another palindrome. In addition, 1712 equals 16 times 107, where 16 plus 107 is 123, which have prime factors 3 and 41, which add up to 44. Also, 17 square minus one equals twice 12 square.
6. This year, Pope Francis will turn 79 where 79 is the 22<sup>nd</sup> palindrome-number prime number. In addition, Pope Francis's 79<sup>th</sup> birthday occurs on the 351<sup>st</sup> day of 2015 where 351 equals  $3 \times 3 \times 3 \times 13$  and coincidentally, these four primes add up to 22. Also, if Pope Francis's 79<sup>th</sup> birthday 17122015 is split as 1712 and 2015, these two numbers differ by palindrome 303. Also, if one splits 17122015 as 17, 12, 20 and 15, these four numbers add up to 64. Interestingly enough, if numbers 1 to 29 are assigned to the letters of the Spanish alphabet, the numbers assigned to the letters of Pope Francis's first name "Jorge" also add up to 64.
7. In Spanish, Pope Francis is written as Papa Francisco. Again, if numbers 1 to 29 are assigned to the letters of the Spanish alphabet, the numbers assigned to the letters of "Francisco" add up to palindrome 101 and the sum of the numbers assigned to "Papa Francisco" equal to palindrome 141. Also, 1712 and 2015 (which together make up Pope Francis's 79<sup>th</sup> birthday 17122015) differ by three times 101, representing "Francisco" in Spanish.
8. Pope Francis is the 266<sup>th</sup> pope where the squares of the prime factors of 266 (2, 7 and 19) add up to palindrome 414.
9. If numbers 1 to 26 are assigned to the letters of the English alphabet, the sum of the numbers assigned to the letters of "Pope" and "Francis" are 52 and 70 respectively. Note that Pope Francis was born on the 352<sup>nd</sup> day of 1936 where the rightmost two digits of 352 equal 52 ("Pope") and the leftmost two digits of 352 times its rightmost digit is 70 ("Francis"). In addition, 52 plus 70 is 122, which is twice 61. It turns out the 61<sup>st</sup> prime number is 283, the reverse of

- which is 382, which equals palindromes 191 plus 191. Interestingly enough, 191 and 191 put side by side as 191191 coincides with the numbers assigned to the letters of "Papa" in Spanish.
10. Pope Francis's 235<sup>th</sup> birthday to occur in 2171 in the 22<sup>nd</sup> century will be a palindrome date given by 17122171.
  11. March 13 (the day Pope Francis was elected as the pope) can also be expressed as 13-03, or simply 1303, and this number is "secretly" connected to Pope Francis and his birth date 17-12-1936. How? First, 1303 is the 213<sup>th</sup> prime number where reverse of 213 is 312, which equals 3 times 104, where 104 equals the sum of the numbers assigned to the letters of Pope Francis's birth last name, "Bergoglio" in Spanish. Second, take the reverse 1303 to obtain 3031 and divide 3031 by the sum of its digits yielding 433. Note that 433 is the 84<sup>th</sup> prime number, where 84 equals  $1 \times 7 \times 12$ , where these three numbers put side by side make up 1712, that is, 17 December. Also,  $84 = 17 + 12 + 19 + 36$ , where these four numbers side by side constitute Pope Francis's birth date, 17121936.
  12. Lastly, if the digits of Pope Francis's birthday 17121936 are numbered from left to right as 1 to 8, and if 17121936 is split into two four-digit numbers such that one number consists of the odd-numbered digits of 17121936 as 1113 and the other its even-numbered digits as 7296, interestingly enough, half of the second number (7296) equals  $3648 = 1712 + 1936$ , that is, the sum of the left- and right-halves of 17121936. Also, 1113 plus its reverse yields 4224, and 4224 divided by the sum of its digits results in 352. Isn't this fascinating?

Welcome to the United States Pope Francis and I hope you will enjoy your visit!