# A formula that seems to generate easily big numbers that are primes or products of very few primes

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**Abstract.** The formula N = (p^4 - 2*p^2 + m)/(m - 1), where p is an odd prime and m is a positive integer greater than 1, seems to generate easily primes or products of very few primes.

**Observation:**

The formula N = (p^4 - 2*p^2 + m)/(m - 1), where p is an odd prime and m is a positive integer greater than 1, seems to generate easily primes or products of very few primes.

**Examples:**

For m = 2 the formula becomes N = p^4 - 2*p^2 + 2 and were obtained the following results for the sequence of the first five consecutive primes of the form 10*k + 1:

: for p = 11, N = 14401 prime;
: for p = 31, N = 921601 prime;
: for p = 41, N = 2822401 = 113*24977;
: for p = 61, N = 13838401 = 3313*4177;
: for p = 71, N = 25401601 = 101*251501.

For a larger prime of the same form, p = 961752931, is obtained N = 855855567096510789934200845104477377601, a semiprime with 39 digits.

For m = 3 the formula becomes N = (p^4 - 2*p^2 + 3)/2 and were obtained the following results for the sequence of the first five consecutive primes of the form 20*k + 9:

: for p = 29, N = 352801 = 17*20753;
: for p = 89, N = 31363201 prime;
: for p = 109, N = 70567201 = 2659*26539;
: for p = 149, N = 246420001 prime;
: for p = 229, N = 1374976801 = 11*124997891.

For m = 4 the formula becomes N = (p^4 - 2*p^2 + 4)/3 and were obtained the following results for the sequence of the first eight consecutive primes of the form 30*k + 13:

: for p = 13, N = 9409 = 97^2;
: for p = 43, N = 1138369 prime;
: for p = 73, N = 9462529 = 1609*5881;
: for p = 103, N = 37509889 = 43*872323;
: for p = 163, N = 235286209 prime;
: for p = 193, N = 462471169 prime;
: for p = 223, N = 824291329 prime;
: for p = 283, N = 2138029249 prime.

For two larger primes of the same form is obtained:

: for p = 1299763, N = 9513392711603539038814 09 prime;
: for p = 1299853, N = 9516027943651211039018 89 prime.

Taking randomly a prime, id est p = 29, are obtained the following results:

: for m = 2, N = 705601, a semiprime;
: for m = 3, N = 352801, a semiprime;
: for m = 4, N = 235201, a semiprime;
: for m = 5, N = 176401, a prime;
: for m = 6, N = 141121, a prime;
: for m = 7, N = 117601, a semiprime;
: for m = 8, N = 100801, a prime;
: for m = 9, N = 88201, a semiprime;
: for m = 10, N = 78401, a prime;
: for m = 11, N = 70561, a semiprime;
: for m = 12, N is not integer;
: for m = 13, N = 58801, a semiprime;
: for m = 14, N is not integer;
: for m = 15, N = 50401, a semiprime;
: for m = 16, N = 47041, a prime;
: for m = 17, N = 44101, a prime (...)