Four conjectures on the numbers 2(p·q·r) ± 1 where p and q=p+6 and r=q+6 are odd numbers

Abstract. In this paper I make the following four conjectures: (I) there exist an infinity of primes of the form 2*(p*q*r) + 1, where p, q = p + 6, r = q + 6 are odd numbers of the form 6*k – 1; (II) there exist an infinity of semiprimes m*n of the form 2*(p*q*r) + 1, where p, q = p + 6, r = q + 6 are odd numbers of the form 6*k – 1, semiprimes having the property that n – m + 1 is prime; (III) there exist an infinity of primes of the form 2*(p*q*r) - 1, where p, q = p + 6, r = q + 6 are odd numbers of the form 6*k + 1; (IV) there exist an infinity of semiprimes m*n of the form 2*(p*q*r) + 1, where p, q = p + 6, r = q + 6 are odd numbers of the form 6*k + 1, semiprimes having the property that n – m + 1 is prime;

Conjecture 1:

There exist an infinity of primes m of the form 2*(p*q*r) + 1, where p, q = p + 6, r = q + 6 are odd numbers of the form 6*k – 1.

The sequence of primes m:

: m = 1871, for (p, q, r) = (5, 11, 17);
: m = 22679, for (p, q, r) = (17, 23, 29);
: m = 46691, for (p, q, r) = (23, 29, 35);
: m = 83231, for (p, q, r) = (29, 35, 41);
: m = 1403531, for (p, q, r) = (83, 89, 95);
: m = 2442383, for (p, q, r) = (101, 107, 113);
: m = 2877659, for (p, q, r) = (107, 113, 119);
: m = 3361751, for (p, q, r) = (113, 119, 125);
: m = 4486751, for (p, q, r) = (125, 131, 137);
: m = 5132843, for (p, q, r) = (131, 137, 143);
: m = 6605171, for (p, q, r) = (143, 149, 155);
: m = 7436591, for (p, q, r) = (149, 155, 161);
: m = 10342979, for (p, q, r) = (167, 173, 179);
: m = 11457791, for (p, q, r) = (173, 179, 185);
: m = 15276563, for (p, q, r) = (191, 197, 203);
(...)

Conjecture 2:

There exist an infinity of semiprimes m*n of the form 2*(p*q*r) + 1, where p, q = p + 6, r = q + 6 are odd numbers of the form 6*k – 1, semiprimes having the property that n – m + 1 is prime.

The sequence of semiprimes m*n:

: m*n = 8603 = 7*1229 where 1229 - 7 + 1 = 1223, prime, for (p, q, r) = (11, 17, 23);
: m*n = 406511 = 7*58073 where 58073 - 7 + 1 = 58067, prime, for (p, q, r) = (53, 59, 65);
: m*n = 18243611 = 139*131249 where 131249 - 139 + 1 = 131111, prime, for (p, q, r) = (203, 209, 215);
(...)

Conjecture 3:

There exist an infinity of primes m of the form 2*(p*q*r) - 1, where p, q = p + 6, r = q + 6 are odd numbers of the form 6*k + 1.

The sequence of primes m:

: m = 3457, for (p, q, r) = (7, 13, 19);
: m = 57349, for (p, q, r) = (25, 31, 37);
: m = 98641, for (p, q, r) = (31, 37, 43);
: m = 449569, for (p, q, r) = (65, 71, 73);
: m = 1222129, for (p, q, r) = (79, 85, 91);
: m = 2178037, for (p, q, r) = (97, 103, 109);
: m = 4087621, for (p, q, r) = (121, 127, 133);
: m = 2178037, for (p, q, r) = (139, 145, 151);
: m = 8649757, for (p, q, r) = (157, 163, 169);
(...)

Conjecture 4:

There exist an infinity of semiprimes m*n of the form 2*(p*q*r) - 1, where p, q = p + 6, r = q + 6 are odd numbers of the form 6*k + 1, semiprimes having the property that n - m + 1 is prime.

The sequence of semiprimes m*n:

: m*n = 12349 = 53*233 where 233 - 53 + 1 = 181, prime, for (p, q, r) = (13, 19, 25);
: m*n = 596701 = 7*85243 where 85243 - 7 + 1 = 85237, prime, for (p, q, r) = (61, 67, 73);
: m*n = 772777 = 23*33599 where 33599 - 23 + 1 = 33577, prime, for (p, q, r) = (67, 73, 79);
: m*n = 18121 = 193*18313 where 18313 - 193 + 1 = 33577, prime, for (p, q, r) = (115, 121, 127);
: m*n = 7728481 = 149*51869 where 51869 - 149 + 1 = 51721, prime, for (p, q, r) = (151, 157, 163);
: m*n = 9641449 = 107*90107 where 90107 - 107 + 1 = 90001, prime, for (p, q, r) = (163, 169, 175);
: m*n = 10706149 = 1481*7229 where 7229 - 1481 + 1 = 5749, prime, for (p, q, r) = (169, 175, 181); (...)