A list of 15 sequences of Poulet numbers based on the multiples of the number 6

Abstract. In previous papers, I presented few applications of the multiples of the number 30 in the study of Carmichael numbers, i.e. in finding possible infinite sequences of such numbers; in this paper I shall list 15 probably infinite sequences of Poulet numbers that I discovered based on the multiples of the number 6.

(1) Poulet numbers of the form
P = (6*n + 7)*(12*n + 13).

First 4 terms: 2701 (= 37*73), 8911 (= 7*19*67), 10585 (= 5*29*73), 18721 (= 97*193), obtained for n = 5, 10, 11.

(2) Poulet numbers of the form
P = (6*n + 7)*(30*n + 31).

First 6 terms: 1729 (= 7*13*19), 4681 (= 31*151), 30889 (= 17*23*157), 41041 (= 7*11*13*41), 46657 (= 13*37*97), 52633 (= 7*73*103), obtained for n = 2, 4, 12, 16.

(3) Poulet numbers of the form
P = (12*n + 13)*(30*n + 31).

First term: 23377 (= 97*241), obtained for n = 7.

(4) Poulet numbers of the form
P = (6*n + 7)*(12*n + 13)*(30*n + 31).

First 5 terms: 2821 (= 7*13*31), 63973 (= 7*13*19*37), 285541 (= 31*61*151), 488881 (= 37*73*181), 7428421 (= 7*11*13*41*181), obtained for n = 0, 2, 4, 5, 14.

Conjecture: The number (6*n + 7)*(12*n + 13)*(30*n + 31) is a Poulet number if (but not only if) 6*n + 7, 12*n + 13 and 30*n + 31 are all three prime numbers.

(5) Poulet numbers of the form
P = (6*n + 1)*(12*n + 1).

First 4 terms: 2701 (= 37*73), 8911 (= 7*19*67), 10585 (= 5*29*73), 18721 (= 97*193), obtained for n = 6, 11, 12, 16.
(6) Poulet numbers of the form
\[ P = (6n + 1)(18n + 1). \]
First 4 terms: 2821 (= 7*13*31), 4033 (= 37*109), 5461 (43*127), 15841 (= 7*31*73), obtained for \( n = 5, 6, 7, 12 \).

(7) Poulet numbers of the form
\[ P = (12n + 1)(18n + 1). \]
First term: 7957 (73*109), obtained for \( n = 6 \).

(8) Poulet numbers of the form
\[ P = (6n + 1)(12n + 1)(18n + 1). \]
First 6 terms: 1729 (= 7*13*19), 172081 (= 7*13*31*61), 294409 (= 37*73*109), 464185 (= 5*17*43*127), 1773289 (= 67*133*199), 4463641 (= 7*13*181*271), obtained for \( n = 1, 5, 6, 7, 11, 15 \).

Note: The numbers \((6n + 1)(12n + 1)(18n + 1)\), when \(6n + 1, 12n + 1\) and \(18n + 1\) are all three primes, are the well known Chernick numbers, so of course they are consequently Poulet numbers, but note that there exist such numbers which are Poulet numbers though \(6n + 1, 12n + 1\) and \(18n + 1\) are not all three primes.

(9) Poulet numbers of the form
\[ P = (6n + 1)(12n + 1)(18n + 1)(36n + 1). \]
First 4 terms: 63973 (= 7*13*19*37), 31146661 (= 7*13*31*61*181), 703995733 (= 7*19*67*199*397), 2414829781 (= 7*13*181*271*541), obtained for \( n = 1, 5, 11, 15 \).

Note: The numbers \((6n + 1)(12n + 1)(18n + 1)(36n + 1)\), when \(6n + 1, 12n + 1, 18n + 1\) and \(36n + 1\) are all four primes, are known that are Carmichael numbers, so of course they are consequently Poulet numbers, but note that there exist such numbers which are Poulet numbers though \(6n + 1, 12n + 1, 18n + 1\) and \(36n + 1\) are not all four primes.

(10) Poulet numbers of the form
\[ P = (6n + 1)(24n + 1). \]
First 5 terms: 1387 (= 19*73), 83665 (= 5*29*577), 90751 (= 151*601), 390937 (= 313*1249), 748657 (= 7*13*19*433), obtained for \( n = 3, 24, 25, 52, 72 \).
(11) Poulet numbers of the form
P = (6*n - 1)*(12*n - 3).

First 2 terms: 561 (= 3*11*17), 4371 (= 3*31*47), obtained for n = 3, 8.

(12) Poulet numbers of the form
P = (6*n - 1)*(18*n - 5).

First 3 terms: 341 (= 11*31), 2465 (5*17*29), 8321 (53*157), obtained for n = 2, 5, 9.

(13) Poulet numbers of the form
P = (6*n - 1)*(24*n - 7).

First 5 terms: 1105 (= 5*13*17), 2047 (= 23*89), 3277 (= 29*113), 6601 (= 7*23*41), 13747 (= 59*233), obtained for n = 3, 4, 5, 7, 10.

(14) Poulet numbers of the form
P = (6*n - 1)*(18*n - 5)*(60*n - 19).

First 2 terms: 340561 (= 13*17*23*67), 4335241 (= 53*157*521), obtained for n = 4, 9.

(15) Poulet numbers of the form
P = (6*n + 1)*(18*n + 1)*(30*n + 1).

First 2 terms: 29341 (= 13*37*61), 1152271 (= 43*127*211), obtained for n = 2, 7.