Title: The product of the prime numbers.
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Abstract: This paper shows that the product of the prime numbers adding and subtracting one is always Simple Prime numbers.

Keywords: Golden Pattern, rough number, prime number, simple prime number.

Introduction

The product of the prime numbers adding one is always simple prime numbers, in all cases to infinity. Also the product of the prime numbers subtracting one is always a simple prime number, in all cases to infinity.

The simple prime numbers are known as the rough numbers.

1) **Demonstration** (The product of the prime numbers adding one is always simple prime numbers)

A) Example 3-Golden Pattern

(2*3)+1=7
The 7 is not divisible by 2 or 3 and is within the sequence of simple prime numbers-3

Reference https://oeis.org/A007310
http://vixra.org/abs/1803.0098

B) Example 5-Golden Pattern

(2*3*5)+1=31
The 31 is not divisible by 2, 3 or 5 and is within the sequence of simple prime numbers-5

Reference https://oeis.org/A007775
http://vixra.org/abs/1802.0201

C) Example 7-Golden Pattern

(2*3*5*7)+1=211
The 211 is not divisible by 2, 3, 5 or 7 and is within the sequence of simple prime numbers-7

Reference https://oeis.org/A008364
http://vixra.org/abs/1801.0064

D) Example 11-Golden Pattern

(2*3*5*7*11)+1=2.311
The 2.311 is not divisible by 2, 3, 5, 7 or 11 and is within the sequence of simple prime numbers-11

Reference https://oeis.org/A008365
http://vixra.org/abs/1802.0236

E) Example 13-Golden Pattern

(2*3*5*7*11*13)+1=30.031
The 30.031 is not divisible by 2, 3, 5, 7, 11 or 13 and is within the sequence of simple prime numbers-13

Reference https://oeis.org/A008366
http://vixra.org/abs/1802.0363

F) Example 17-Golden Pattern

(2*3*5*7*11*13*17)+1=510.511
The 510.511 is not divisible by 2, 3, 5, 7, 11, 13 or 17 and is within the sequence of simple prime numbers-17

Reference https://oeis.org/A166061

G) Example 19-Golden Pattern

(2*3*5*7*11*13*17*19)+1=9.699.691
The 9.699.691 is not divisible by 2, 3, 5, 7, 11, 13, 17 or 19 and is within the sequence of simple prime numbers-19

Reference https://oeis.org/A166063

2) **Demonstration** (the product of the prime numbers subtracting one is always a simple prime number)

A) Example 3-Golden Pattern

(2*3)-1=5
The 7 is not divisible by 2 or 3 and is within the sequence of simple prime numbers-3

Reference https://oeis.org/A007310
http://vixra.org/abs/1803.0098

B) Example 5-Golden Pattern

(2*3*5)-1=29
The 31 is not divisible by 2, 3 or 5 and is within the sequence of simple prime numbers-5

Reference https://oeis.org/A007775
http://vixra.org/abs/1802.0201

C) Example 7-Golden Pattern

(2*3*5*7)-1=209
The 211 is not divisible by 2, 3, 5 or 7 and is within the sequence of simple prime numbers-7

Reference https://oeis.org/A008364
http://vixra.org/abs/1801.0064

D) Example 11-Golden Pattern

(2*3*5*7*11)-1=2.309
The 2.311 is not divisible by 2, 3, 5, 7 or 11 and is within the sequence of simple prime numbers-11

Reference https://oeis.org/A008365
http://vixra.org/abs/1802.0236

E) Example 13-Golden Pattern

(2*3*5*7*11*13)-1=30.029
The 30.031 is not divisible by 2, 3, 5, 7, 11 or 13 and is within the sequence of simple prime numbers-13

Reference https://oeis.org/A008366
http://vixra.org/abs/1802.0363

F) Example 17-Golden Pattern

(2*3*5*7*11*13*17)-1=510.509
The 510.511 is not divisible by 2, 3, 5, 7, 11, 13 or 17 and is within the sequence of simple prime numbers-17

Reference https://oeis.org/A166061

G) Example 19-Golden Pattern

(2*3*5*7*11*13*17*19)-1=9.699.689
The 9.699.691 is not divisible by 2, 3, 5, 7, 11, 13, 17 or 19 and is within the sequence of simple prime numbers-19

Reference https://oeis.org/A166063

We could continue adding examples infinitely with the following prime numbers.

Final conclusion

The product of the prime numbers adding 1 always results in a simple prime number, also if we subtract one. This happens in all cases to infinity.

References

Enzo R. Gentile, Elementary arithmetic (1985) OEA.
Burton W. Jones, Theory of numbers
Iván Vinográdov, Fundamentals of Number Theory
Niven y Zuckermann, Introduction to the theory of numbers
Dickson L. E., History of the Theory of Numbers, Vol. 1
Zeolla Gabriel Martin, 7-Golden Pattern. http://vixra.org/abs/1801.0064
Zeolla Gabriel Martin, 3-Golden Pattern. http://vixra.org/abs/1803.0098
Zeolla Gabriel Martin, 5-Golden Pattern. http://vixra.org/abs/1802.0201
Zeolla Gabriel Martin, 7-Golden Pattern, Formula to Get the Sequence. http://vixra.org/abs/1801.0381
Zeolla Gabriel Martin, 11-Golden Pattern. http://vixra.org/abs/1802.0236
Zeolla Gabriel Martin, 13-Golden Pattern. http://vixra.org/abs/1802.0363
Zeolla, Gabriel Martin, Construction of the Golden Patterns http://vixra.org/abs/1803.0121

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