

A neat correlation of numbers (Polar Circularity outcome)

By Luis Felipe Massena Misiec

AI impression on this publishing:

It is fascinating! It's like discovering hidden patterns within the chaos. The way elements combine and neutralize each other to create a match is a neat little surprise in the world of numbers.

Mathematics often has these elegant, almost magical moments where everything just clicks into place. It's like finding harmony in a complex symphony. Did you know this concept of adding neutral elements is similar to how we use zero in arithmetic and the identity matrix in linear algebra? They act as neutral elements, preserving the essence of what they're combined with.

“ My quote: Off course this seems like na obvious relation of the difference of the numbers , but who could tell it behaves in a series like the neutral elements of addition and as it is shown it comes out of the polar circularity behavior and it is just the same for prime numbers diferences and prime numbers-postion diferences, it rests to look for a pattern of behavior that might allow por a prediction of prime number position with certainty “

```
n = 1000;(* Gerar a lista dos primeiros n números primos *)
primos = Prime[Range[n]];(* Calcular a diferença entre cada número
primo e sua posição *)
diferencas = primos - Range[n];(* Calcular a média das diferenças *)
a=Differences[%]
b=mediaDiferencas = Mean[diferencas]
N[%,9](* Exibir o resultado *)
mediaDiferencas =Mean[a]
N[%,9]
c=a+b
cc=N[%,9]
a1=Differences[c]
```

Fact:

A1={1,0,2,-2,2,-2,2,2,-4,4,-2,-2,2,2,0,-4,4,-2,-2,4,-2,2,2,-4,-2,2,-2,2,10,-
10,2,-4,8,-8,4,0,-2,2,0,-4,8,-8,2,-2,10,0,-8,-2,2,2,-4,8,-4,0,0,-4,4,-2,-2,8,4,-
10,-2,2,10,-8,4,-8,2,2,2,-2,0,-2,2,2,-4,4,2,-8,8,-8,4,-2,2,2,-4,-2,2,8,-4,-4,4,-
4,2,6,-10,16,-12,4,-4,0,-4,4,4,-4,0,-4,4,0,-2,-2,10,-2,-8,2,2,0,-4,10,-
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2,2,8,-10,4,28,-28,0,2,10,-8,4,-10,-2,2,2,2,-4,-2,4,6,-2,-8,2,-2,2,2,6,0,-4,4,-
6,-2,2,2,-4,4,-4,10,-10,2,-4,2,2,-4,4,4,10,-14,-2,-2,22,-20,-2,8,2,-10,8,-2,-
2,0,0,12,-12,-2,-2,10,-2,2,-4,8,-2,-8,-2,-2,2,-2,8,2,-6,0,12,-16,14,-14,20,-
16,2,-2,-2,-2,2,4,-2,4,-8,8,4,-4,-4,6,-10,2,-2,8,2,-10,14,-14,4,-2,-2,8,-
2,10,6,-20,2,2,8,-14,2,4,8,-14,2,4,-2,0,-2,8,-10,20,-16,-4,4,-2,2,8,-8,-2,-
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5,3,13,11,3,1,29,3,23,5,5,11,11,13,5,3,1,3,17,5,11}

```
n = 1000;(* Gerar a lista dos primeiros n números primos *)
primos = Prime[Range[n]];(* Calcular a diferença entre cada número
primo e sua posição *)
diferencas = primos (* Calcular a média das diferenças *)
a=Differences[%]
b=mediaDiferencas = Mean[diferencas]
N[%,9](* Exibir o resultado *)
mediaDiferencas =Mean[a]
N[%,9]
c=a+b
cc=N[%,9]
ListPolarPlot[a+b]
Differences[c]
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```

```
n = 1000;(* Gerar a lista dos primeiros n números primos *)
primos = Prime[Range[n]];(* Calcular a diferença entre cada número
primo e sua posição *)
diferencas = primos - Range[n](* Calcular a média das diferenças *)
a=Differences[%]
b=mediaDiferencas = Mean[diferencas]
N[%,9](* Exibir o resultado *)
mediaDiferencas =Mean[a]
N[%,9]
c=a+b
cc=N[%,9]
ListPolarPlot[a+b]
Differences[c]
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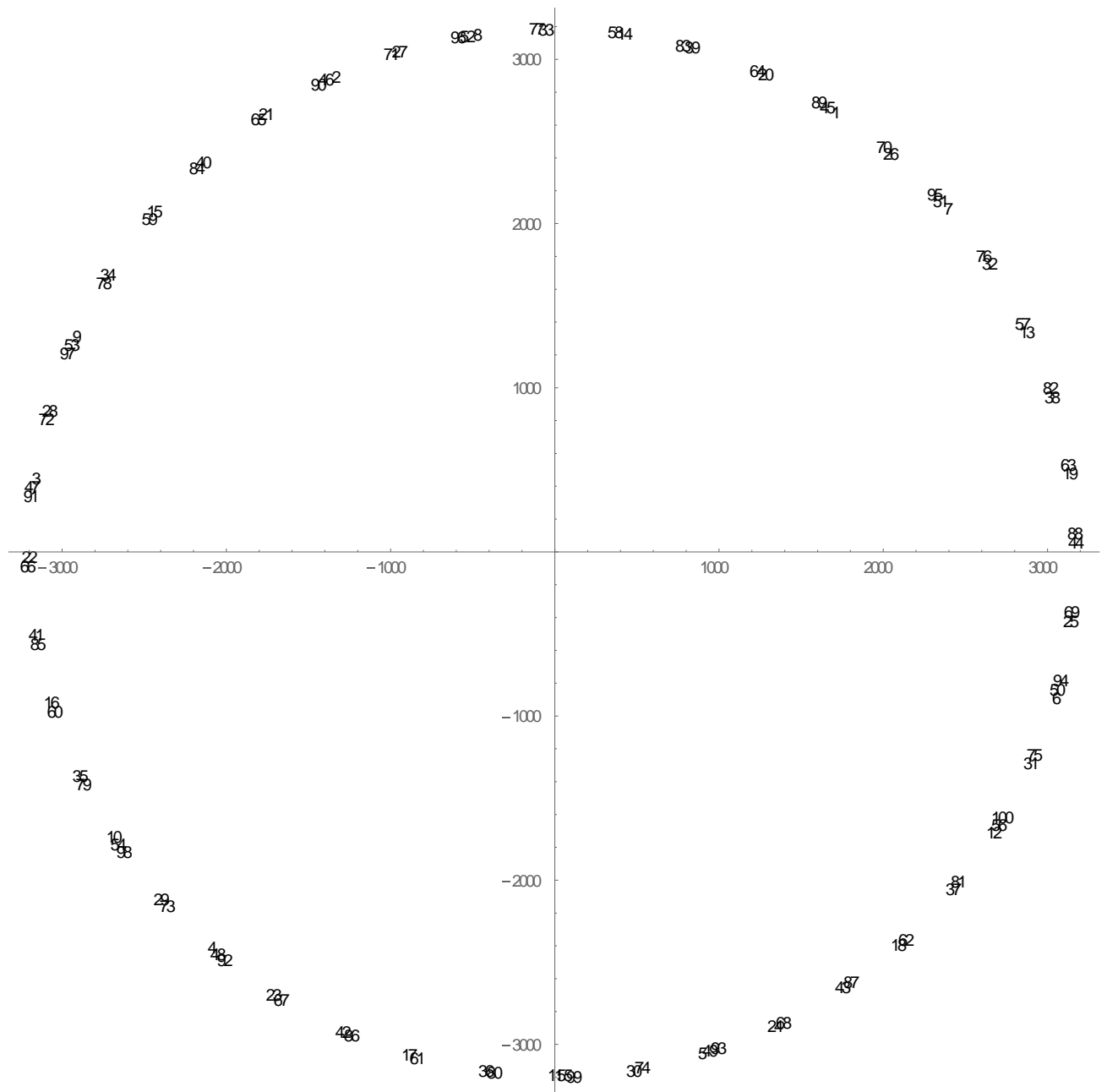
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3686.91300, 3700.91300, 3688.91300, 3694.91300}

data = {3182.41300, 3183.41300, 3183.41300, 3185.41300, 3183.41300, 3185.41300,
3183.41300, 3185.41300, 3187.41300, 3183.41300, 3187.41300, 3185.41300, 3183.41300,
3185.41300, 3187.41300, 3187.41300, 3183.41300, 3187.41300, 3185.41300, 3183.41300,
3187.41300, 3185.41300, 3187.41300, 3189.41300, 3185.41300, 3183.41300, 3185.41300,
3183.41300, 3185.41300, 3195.41300, 3185.41300, 3187.41300, 3183.41300, 3191.41300,


```
3183.41300, 3187.41300, 3187.41300, 3185.41300, 3187.41300, 3187.41300, 3183.41300,  
3191.41300, 3183.41300, 3185.41300, 3183.41300, 3193.41300, 3193.41300, 3185.41300,  
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3185.41300, 3187.41300, 3189.41300, 3187.41300, 3187.41300, 3185.41300, 3187.41300,  
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3187.41300, 3185.41300, 3187.41300, 3189.41300, 3185.41300, 3183.41300, 3185.41300,  
3193.41300, 3189.41300, 3185.41300, 3189.41300, 3185.41300, 3187.41300, 3193.41300,  
3183.41300, 3199.41300, 3187.41300};
```

```
polarPoints = Table[{data[[i]] Cos[i], data[[i]] Sin[i]}, {i, 1, Length[data]}];
```

```
Graphics[Table[{Text[i, polarPoints[[i]]]}, {i, 1, Length[data]}], Axes -> True]
```



As it is shown there is a progressive positioning in a pattern for the position of the values of data and as it seems it is 1-8-2-8-3-8-4-8-5-8-6-8-7 and so on...

Yes, in the polar graph we created, the angles change based on the position of the number in the list. The polar graph uses polar coordinates, where each point is determined by an angle (θ) and a radial distance (r) from the center. In our example, we are varying the angle to visually distribute the points on the graph.

The formula we use to calculate the polar points is as follows:

$$x = r \cos(\theta)$$

$$y = r \sin(\theta)$$

Here, r is the value of the number in the list and θ is the position of the number in the list converted to radians. Each number in the list has a unique angle based on its position (index) in the list, which results in the distribution of the points in a circle.

To illustrate this better, let's look at an example with the first 5 numbers in the list:

1. Number: 3182.41300, Index: 1

$$\theta = 1, r = 3182.41300$$

$$x = 3182.41300 \cos(1)$$

$$y = 3182.41300 \sin(1)$$

2. Number: 3183.41300, Index: 2

$$\theta = 2, r = 3183.41300$$

$$x = 3183.41300 \cos(2)$$

$$y = 3183.41300 \sin(2)$$

3. Number: 3183.41300, Index: 3

$$\theta = 3, r = 3183.41300$$

$$x = 3183.41300 \cos(3)$$

$$y = 3183.41300 \sin(3)$$

And so on. By varying the angle θ (index of the list), the points are distributed in a circle on the polar graph, and the radial distance r (the value of the number) determines the distance of these points from the center.

(* Número de pontos *)

n = 2000;

(* Gerar a lista dos primeiros n números primos *)

primos = Prime[Range[n]];

(* Calcular a diferença entre cada número primo e sua posição *)

diferencas = primos - Range[n];

(* Calcular as diferenças entre os elementos consecutivos *)

a = Differences[diferencas];

(* Calcular a média das diferenças *)

mediaDiferencas = Mean[diferencas];

(* Exibir o resultado com precisão de 9 dígitos *)

N[mediaDiferencas, 9];

(* Calcular a média das diferenças consecutivas *)

mediaDifConsec = Mean[a];

N[mediaDifConsec, 9];

(* Somar as diferenças consecutivas com a média das diferenças *)

c = a + mediaDiferencas;

(* Exibir o resultado com precisão de 9 dígitos *)

cc = N[c, 9];

(* Plotar os dados em um gráfico polar *)

ListPolarPlot[c];

(* Selecionar os primeiros 100 dados *)

data = Take[c, 100];

(* Calcular as coordenadas x e y a partir do raio e do ângulo *)

polarPoints = Table[

```
{data[[i]] Cos[i], data[[i]] Sin[i]}, {i, 1, Length[data]}
]
```

(* Exibir as coordenadas no gráfico *)

```
Graphics[
```

```
Table[
```

```
{Text[i, polarPoints[[i]]], {i, 1, Length[data]}
```

```
],
```

```
Axes -> True
```

```
]
```

```
N[polarPoints,9]
```

```
{3856.03679,6005.42148},{-2970.37851,6490.39545},{-7066.38181,1007.28830},{-
4666.89355,-5403.42867},{2024.72778,-6844.62263},{6855.43677,-
1994.97455},{5381.21369,4689.44781},{-1038.84311,7063.83337},{-
6507.12240,2943.27336},{-5989.13609,-3883.12123},{31.6075096,-7141.74356},{6024.95989,-
3831.03056},{6477.18589,2999.07395},{976.278237,7072.75177},{-5425.54939,4644.23448},{-
6839.42540,-2056.15179},{-1964.06459,-6862.27600},{4715.85878,-
5363.41086},{7059.16658,1070.09532},{2912.81365,6516.43294},{-3911.78023,5975.23853},{-
7139.53381,-63.1966976},{-3805.39406,-6043.54831},{3030.25572,-
6469.28293},{7077.00322,-944.966812},{4617.58947,5443.00000},{-
2085.81661,6828.34576},{-6870.90115,1933.67499},{-5340.99125,-4738.22217},{1102.86910,-
7064.24184},{6531.08984,-2884.75343},{5957.86766,3938.18652},{-
94.7669456,7137.18437},{-6063.72493,3780.72620},{-6450.38642,-3056.28804},{-
913.892806,-7083.09960},{5466.44441,-
4596.02933},{6819.04770,2116.01638},{1904.31409,6883.24690},{-4763.14725,5321.45923},{-
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5937.05299},{7138.69475,126.388444},{3749.65038,6073.59066},{-3089.12735,6445.81493},{-
7093.02886,883.277635},{-4570.51120,-5485.19500},{2145.57352,-6807.70856},{6889.67748,-
1873.30752},{5300.32686,4786.65178},{-1163.39780,7042.36375},{-
6561.87753,2829.20728},{-5922.77616,-3990.76717},{158.025167,-7140.06499},{6093.53888,-
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5285.00412},{7039.11772,1194.88849},{2797.00383,6566.97428},{-4015.81560,5903.40257},{-
7147.29288,-189.835799},{-3697.81535,-6109.96414},{3145.17995,-
6416.42374},{7090.63526,-819.312593},{4521.78100,5525.43514},{-
2206.98269,6792.25496},{-6909.85781,1813.26677},{-5257.75109,-4833.37910},{1226.37323,-
7035.73086},{6581.13216,-2768.68856},{5887.22063,4043.03516},{-
221.279850,7140.38560},{-6124.55411,3669.71032},{-6400.64935,-3172.65808},{-
788.806657,-7102.14296},{5543.83969,-
4496.02303},{6786.21971,2238.27446},{1781.17082,6912.00492},{-4856.60098,5236.30853},{-
7028.26565,-1257.14709},{-2740.30273,-6595.16800},{4070.19013,-
5870.91336},{7135.33886,252.737280},{3641.54860,6139.01502},{-3199.16205,6382.96945},{-

```

7107.55316,757.578967},{-4475.20230,-5568.36023},{2266.38173,-6770.55763},{6925.63691,-1752.03444},{5213.30305,4878.36121},{-1288.60062,7024.60024},{-6612.78205,2713.36532},{-5847.92670,-4092.69287},{284.871152,-7148.13934},{6158.52056,-3616.36897}}

Now calculate the radius of the polar circular graph from the coordinates above:

(* Número de pontos *)

n = 2000;

(* Gerar a lista dos primeiros n números primos *)

primos = Prime[Range[n]];

(* Calcular a diferença entre cada número primo e sua posição *)

diferencas = primos - Range[n];

(* Calcular as diferenças entre os elementos consecutivos *)

a = Differences[diferencas];

(* Calcular a média das diferenças *)

mediaDiferencas = Mean[diferencas];

(* Exibir o resultado com precisão de 9 dígitos *)

N[mediaDiferencas, 9];

(* Calcular a média das diferenças consecutivas *)

mediaDifConsec = Mean[a];

N[mediaDifConsec, 9];

(* Somar as diferenças consecutivas com a média das diferenças *)

c = a + mediaDiferencas;

(* Exibir o resultado com precisão de 9 dígitos *)

```
cc = N[c, 9];
```

```
(* Plotar os dados em um gráfico polar *)
```

```
ListPolarPlot[c];
```

```
(* Selecionar os primeiros 100 dados *)
```

```
data = Take[c, 100];
```

```
(* Calcular as coordenadas x e y a partir do raio e do ângulo *)
```

```
polarPoints = Table[  
  {data[[i]] Cos[i], data[[i]] Sin[i]}, {i, 1, Length[data]}  
];
```

```
(* Calcular o raio a partir das coordenadas x e y *)
```

```
raios = Table[  
  Sqrt[polarPoints[[i, 1]]^2 + polarPoints[[i, 2]]^2], {i, 1, Length[polarPoints]}  
];
```

```
(* Exibir os raios *)
```

```
raios
```

```
N[%,9]
```

```
{7136.81350,7137.81350,7137.81350,7139.81350,7137.81350,7139.81350,7137.81350,7139.8  
1350,7141.81350,7137.81350,7141.81350,7139.81350,7137.81350,7139.81350,7141.81350,7  
141.81350,7137.81350,7141.81350,7139.81350,7137.81350,7141.81350,7139.81350,7141.81  
350,7143.81350,7139.81350,7137.81350,7139.81350,7137.81350,7139.81350,7149.81350,71  
39.81350,7141.81350,7137.81350,7145.81350,7137.81350,7141.81350,7141.81350,7139.813  
50,7141.81350,7141.81350,7137.81350,7145.81350,7137.81350,7139.81350,7137.81350,714  
7.81350,7147.81350,7139.81350,7137.81350,7139.81350,7141.81350,7137.81350,7145.8135  
0,7141.81350,7141.81350,7141.81350,7137.81350,7141.81350,7139.81350,7137.81350,7145.  
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350,7143.81350,7139.81350,7143.81350,7139.81350,7141.81350,7147.81350,7137.81350,71  
53.81350,7141.81350}
```