

## Programs related to prime arclength prediction trials

```
x1 = 1381804.899 (* insira o valor de x1 aqui *);
x = 2965178.021 (* insira o valor de x aqui *);
y1 = 263881 (* insira o valor de y1 aqui *);
T = 10.4729 (* insira o valor de T aqui *);
z = x * T (* insira o valor de z aqui *); (* Definindo a equação *)
g = z / x1
g1 = N[g, 9]
dd = g1 / 2
jk = y1 * dd
g1 / T
equacao = (x1 * x) / (y1 * y) == T * t1;
(* Usando Solve para encontrar y e t1 *)
solucao = y /. FindInstance[{equacao, t1 == g1 / 2}, {y, t1}]
solucao2 = t1 /. FindInstance[{equacao, t1 == g1 / 2}, {y, t1}]
(* Exibindo a solução *)
a = solucao
b = solucao2
y1 * b
(* Definindo os valores *)
x1 = 1381804.899;
x = 2965178.021;
y1 = 263881;
T = 10.4729;
z = x * T;
g = z / x1;
g1 = N[g, 9];
dd = g1 / 2;

(* Criando a tabela *)
tabela = Table[
  {
    "Denominador" -> i,
    "dd" -> g1 / i,
    "jk" -> y1 * (g1 / i)
  },
  {i, 1, 10} (* Variando o denominador de 1 a 10 *)
];

(* Exibindo a tabela *)
tabela
```

22.4735

22.4735

11.2368

$2.96517 \cdot 10^6$

2.14587

{131942.}

{11.2368}

{131942.}

{11.2368}

$\{2.96517 \cdot 10^6\}$

{{Denominador->1,dd->22.4735,jk->5.93033\*10^6},{Denominador->2,dd->11.2368,jk->2.96517\*10^6},{Denominador->3,dd->7.49117,jk->1.97678\*10^6},{Denominador->4,dd->5.61838,jk->1.48258\*10^6},{Denominador->5,dd->4.4947,jk->1.18607\*10^6},{Denominador->6,dd->3.74559,jk->988389.},{Denominador->7,dd->3.2105,jk->847191.},{Denominador->8,dd->2.80919,jk->741292.},{Denominador->9,dd->2.49706,jk->658926.},{Denominador->10,dd->2.24735,jk->593033.}}

(\* Definindo a função \*)

f[x\_] := 6.597032

(\* Calculando a integral definida \*)

valorIntegral = Integrate[f[x], {x, -a, a}]

(\* Igualando ao valor dado e resolvendo para a \*)

solucao= Solve[valorIntegral == 1976777.8560, a]

(\* Definindo a função constante \*)

f[x\_] := 6.597032

(\* Comprimento de arco para uma função constante entre -a e a \*)

comprimentoArco = 2 \* b \* f[x]

(\* Igualando ao valor dado e resolvendo para a \*)

solucao1=Solve[comprimentoArco == 5930333,b]

a1=a /. solucao[[1]]

b1=b /. solucao1[[1]]

$c = b_1/a_1$

13.1941 a

{{a->149823.}}

13.1941 b

{{b->449470.}}

149823.

449470.

3.

$c = 6.597032310;$

(\* Given value of n \*)

$n = 15000;$

(\* Calculate the definite integral from -n to n \*)

$\text{desiredIntegral} = c * 2 * n;$

(\* Print the result \*)

`Print["The definite integral from -", n, " to ", n, " is ", desiredIntegral];`

The definite integral from -15000 to 15000 is 197911.

(\* Given constant c \*)

$c = 6.597032310;$

(\* Desired definite integral value \*)

$\text{desiredIntegral} = 149823;$

(\* Function to calculate the definite integral from -n to n \*)

$\text{CalculateIntegral}[n\_]:=c*2*n$

```
(* Solve for n *)
```

```
n = desiredIntegral / (c * 2);
```

```
(* Print the interval *)
```

```
Print["The interval [-", n, ", ", n, "] results in a definite integral of ", desiredIntegral];
```

```
The interval [-11355.3, 11355.3] results in a definite integral of 149823
```

```
c = 6.597032310;
```

```
(* Lista de números primos nas posições desejadas *)
```

```
primos = {120689, 163841, 224737, 15485863, 999999000001};
```

```
(* Função para calcular a integral definida de -n até n *)
```

```
CalcularIntegral[n_] := c * 2 * n
```

```
(* Calcular e imprimir as integrais para cada número primo *)
```

```
resultados = Table[
```

```
  n = primo;
```

```
  integral = CalcularIntegral[n];
```

```
  Print["A integral definida de -", n, " até ", n, " é ", integral];
```

```
  integral,
```

```
  {primo, primos}
```

```
]
```

```
(* Ajuste para calcular a integral1 *)
```

```
primos = {120689, 163841, 224737, 15485863, 999999000001};
```

```
primos = PrimePi[primos];
```

```
resultados1 = Table[
```

```
  n = primo;
```

```
  integral1 = CalcularIntegral[n];
```

```
  Print["A integral definida de -", n, " até ", n, " é ", integral1];
```

```

integral1,
{primo, primos}
]

```

(\* Calcular e imprimir as divisões \*)

```
divisoos = resultados / resultados1;
```

```
Print["Os valores das divisões são: ", divisoos];
```

```
a=divisoos
```

```
resultados1/(2*c)
```

```
(Debug) During evaluation of In[51]:= A integral definida de -120689 até 120689 é
1.59238*10^6
```

```
(Debug) During evaluation of In[51]:= A integral definida de -163841 até 163841 é
2.16173*10^6
```

```
(Debug) During evaluation of In[51]:= A integral definida de -224737 até 224737 é
2.96519*10^6
```

```
(Debug) During evaluation of In[51]:= A integral definida de -15485863 até 15485863 é
2.04321*10^8
```

```
(Debug) During evaluation of In[51]:= A integral definida de -999999000001 até 999999000001
é 1.31941*10^13
```

```
(Debug) Out[54]= {1.59238*10^6,2.16173*10^6,2.96519*10^6,2.04321*10^8,1.31941*10^13}
```

```
(Debug) During evaluation of In[51]:= A integral definida de -11357 até 11357 é 149845.
```

```
(Debug) During evaluation of In[51]:= A integral definida de -15000 até 15000 é 197911.
```

```
(Debug) During evaluation of In[51]:= A integral definida de -20000 até 20000 é 263881.
```

```
(Debug) During evaluation of In[51]:= A integral definida de -1000000 até 1000000 é
1.31941*10^7
```

```
(Debug) During evaluation of In[51]:= A integral definida de -37607875619 até 37607875619 é
4.96201*10^11
```

```
(Debug) Out[57]= {149845.,197911.,263881.,1.31941*10^7,4.96201*10^11}
```

```
(Debug) During evaluation of In[51]:= Os valores das divisões são:
{10.6268,10.9227,11.2368,15.4859,26.5901}
```

```
(Debug) Out[60]= {10.6268,10.9227,11.2368,15.4859,26.5901}
```

```
(Debug) Out[61]= {11357.,15000.,20000.,1.*10^6,3.76079*10^10}
```

A Linear Graph from

(\* Given constant c \*)

c = 6.597032310;

(\* Given value of n \*)

n = Range[10000,15000];

(\* Calculate the definite integral from -n to n \*)

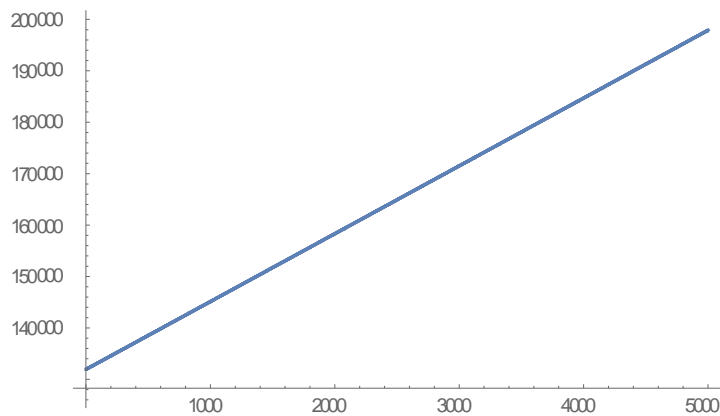
desiredIntegral = c \* 2 \* n

{131941.,131954.,131967.,131980.,131993.,132007.,132020.,132033.,132046.,132059.,132073.,132086.,132099.,132112.,132125.,132139.,132152.,132165.,132178.,132191.,132205.,132218.,132231.,132244.,132257.,132270.,132284.,132297.,132310.,132323.,132336.,132350.,132363.,132376.,132389.,132402.,132416.,132429.,132442.,132455.,132468.,132482.,132495.,132508.,132521.,132534.,132548.,132561.,132574.,132587.,132600.,132614.,132627.,132640.,132653.,132666.,132680.,132693.,132706.,132719.,132732.,132745.,132759.,132772.,132785.,132798.,132811.,132825.,132838.,132851.,132864.,132877.,132891.,132904.,132917.,132930.,132943.,132957.,132970.,132983.,132996.,133009.,133023.,133036.,133049.,133062.,133075.,133089.,133102.,133115.,133128.,133141.,133155.,133168.,133181.,133194.,133207.,133220.,133234.,133247.,133260.,133273.,133286.,133300.,133313.,133326.,133339.,133352.,133366.,133379.,133392.,133405.,133418.,133432.,133445.,133458.,133471.,133484.,133498.,133511.,133524.,133537.,133550.,133564.,133577.,133590.,133603.,133616.,133629.,133643.,133656.,133669.,133682.,133695.,133709.,133722.,133735.,133748.,133761.,133775.,133788.,133801.,133814.,133827.,133841.,133854.,133867.,133880.,133893.,133907.,133920.,133933.,133946.,133959.,133973.,133986.,133999.,134012.,134025.,134039.,134052.,134065.,134078.,134091.,134104.,134118.,134131.,134144.,134157.,134170.,134184.,134197.,134210.,134223.,134236.,134250.,134263.,134276.,134289.,134302.,134316.,134329.,134342.,134355.,134368.,134382.,134395.,134408.,134421.,134434.,134448.,134461.,134474.,134487.,134500.,134513.,134527.,134540.,134553.,134566.,134579.,134593.,134606.,134619.,134632.,134645.,134659.,134672.,134685.,134698.,134711.,134725.,134738.,134751.}

(\* Print the result \*)

Print["The definite integral from -", n, " to ", n, " is ", desiredIntegral];

ListLinePlot[desiredIntegral]



mathematica

( Definindo a sequência dada )

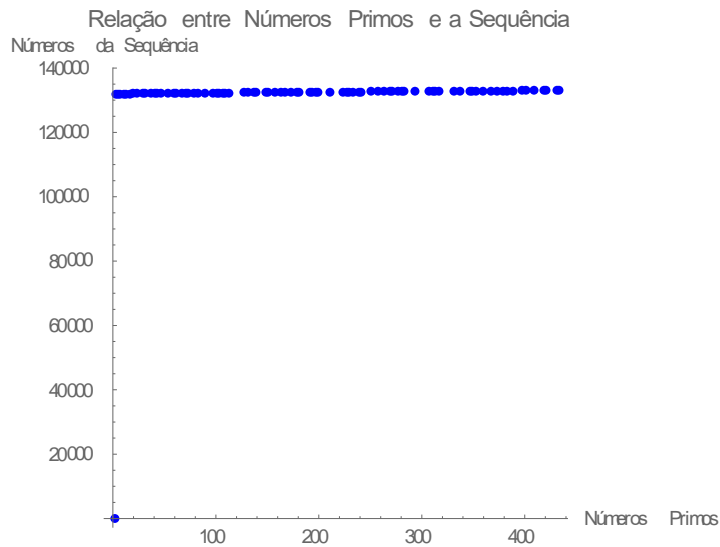
```
sequencia = {0, 131941, 131954, 131967, 131980, 131993, 132007, 132020, 132033, 132046,
132059, 132073, 132086, 132099, 132112, 132125, 132139, 132152, 132165,
132178, 132191, 132205, 132218, 132231, 132244, 132257, 132270, 132284,
132297, 132310, 132323, 132336, 132350, 132363, 132376, 132389, 132402,
132416, 132429, 132442, 132455, 132468, 132482, 132495, 132508, 132521,
132534, 132548, 132561, 132574, 132587, 132600, 132614, 132627, 132640,
132653, 132666, 132680, 132693, 132706, 132719, 132732, 132745, 132759,
132772, 132785, 132798, 132811, 132825, 132838, 132851, 132864, 132877,
132891, 132904, 132917, 132930, 132943, 132957, 132970, 132983, 132996,
133009, 133023};
```

( Encontrando os números primos até o último número da sequência )

```
primos = Select[Range[Max[sequencia]], PrimeQ];
```

( Criando um gráfico da relação entre os números primos e a sequência )

```
ListPlot[Transpose[{primos[[1 ;; Length[sequencia]]], sequencia}],
PlotStyle -> {PointSize[Medium], Blue},
AxesLabel -> {"Números Primos", "Números da Sequência"},
PlotLabel -> "Relação entre Números Primos e a Sequência",
AspectRatio -> 1]
```



(\* Dado constante c \*)

c = 6.597032310;

(\* Dado valor de n como os números primos de 10000 a 15000 \*)

n = Prime[Range[10000, 15000]];

(\* Calcular a integral definida de -n a n \*)

desiredIntegral = c \* 2 \* n;

(\* Imprimir o resultado \*)

Print["A integral definida de -", n, " a ", n, " é ", desiredIntegral];

(\* Plotar o resultado \*)

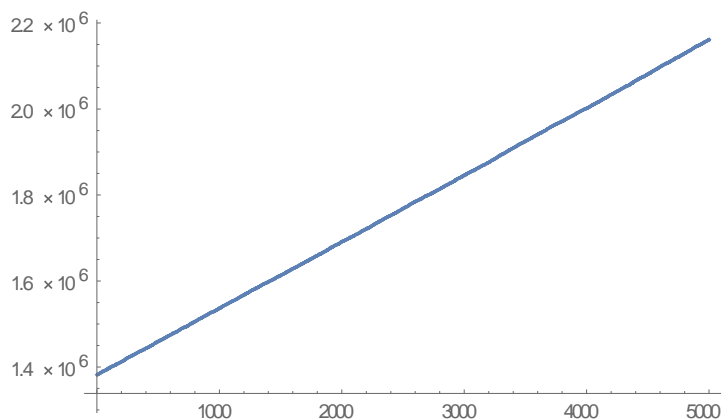
ListLinePlot[desiredIntegral]

{104729,104743,104759,104761,104773,104779,104789,104801,104803,104827,104831,104849,104851,104869,104879,104891,104911,104917,104933,104947,104953,104959,104971,104987,104999,105019,105023,105031,105037,105071,105097,105107,105137,105143,105167,105173,105199,105211,105227,105229,105239,105251,105253,105263,105269,105277,105319,105323,105331,105337,105341,105359,105361,105367,105373,105379,105389,105397,105401,105407,105437,105449,105467,105491,105499,105503,105509,105517,105527,105529,105533,105541,105557,105563,105601,105607,105613,105619,105649,105653,105667,105673,105683,105691,105701,105727,105733,105751,105761,105767,105769,105817,105829,105863,105871,105883,105899,105907,105913,105929,105943,105953,105967,105971,105977,105983,105997,106013,106019,106031,106033,106087,106103,106109,106121,106123,1061



29,106163,106181,106187,106189,106207,106213,106217,106219,106243,106261,106273,106277,106279,106291,106297,106303,106307,106319,106321,106331,106349,106357,106363,106367,106373,106391,106397,106411,106417,106427,106433,106441,106451,106453,106487,106501,106531,106537,106541,106543,106591,106619,106621,106627,106637,106649,106657,106661,106663,106669,106681,106693,106699,106703,106721,106727,106739,106747,106751,106753,106759,106781,106783,106787,106801,106823,106853,106859,106861,106867,106871,106877,106903,106907,106921,106937,106949,106957,106961,106963,106979, É

{1.3818\*10<sup>6</sup>,1.38199\*10<sup>6</sup>,1.3822\*10<sup>6</sup>,1.38222\*10<sup>6</sup>,1.38238\*10<sup>6</sup>,1.38246\*10<sup>6</sup>,1.38259\*10<sup>6</sup>,1.38275\*10<sup>6</sup>,1.38278\*10<sup>6</sup>,1.38309\*10<sup>6</sup>,1.38315\*10<sup>6</sup>,1.38338\*10<sup>6</sup>,1.38341\*10<sup>6</sup>,1.38365\*10<sup>6</sup>,1.38378\*10<sup>6</sup>,1.38394\*10<sup>6</sup>,1.3842\*10<sup>6</sup>,1.38428\*10<sup>6</sup>,1.38449\*10<sup>6</sup>,1.38468\*10<sup>6</sup>,1.38476\*10<sup>6</sup>,1.38484\*10<sup>6</sup>,1.38499\*10<sup>6</sup>,1.38521\*10<sup>6</sup>,1.38536\*10<sup>6</sup>,1.38563\*10<sup>6</sup>,1.38568\*10<sup>6</sup>,1.38579\*10<sup>6</sup>,1.38586\*10<sup>6</sup>,1.38631\*10<sup>6</sup>,1.38666\*10<sup>6</sup>,1.38679\*10<sup>6</sup>,1.38718\*10<sup>6</sup>,1.38726\*10<sup>6</sup>,1.38758\*10<sup>6</sup>,1.38766\*10<sup>6</sup>,1.388\*10<sup>6</sup>,1.38816\*10<sup>6</sup>,1.38837\*10<sup>6</sup>,1.3884\*10<sup>6</sup>,1.38853\*10<sup>6</sup>,1.38869\*10<sup>6</sup>,1.38871\*10<sup>6</sup>,1.38885\*10<sup>6</sup>,1.38893\*10<sup>6</sup>,1.38903\*10<sup>6</sup>,1.38959\*10<sup>6</sup>,1.38964\*10<sup>6</sup>,1.38974\*10<sup>6</sup>,1.38982\*10<sup>6</sup>,1.38988\*10<sup>6</sup>,1.39011\*10<sup>6</sup>,1.39014\*10<sup>6</sup>,1.39022\*10<sup>6</sup>,1.3903\*10<sup>6</sup>,1.39038\*10<sup>6</sup>,1.39051\*10<sup>6</sup>,1.39061\*10<sup>6</sup>,1.39067\*10<sup>6</sup>,1.39075\*10<sup>6</sup>,1.39114\*10<sup>6</sup>,1.3913\*10<sup>6</sup>,1.39154\*10<sup>6</sup>,1.39186\*10<sup>6</sup>,1.39196\*10<sup>6</sup>,1.39201\*10<sup>6</sup>,



c = 6.597032310;

(\* Dado valor de n como os números primos de 10000 a 15000 \*)

n = Prime[Range[10000, 15000]];

(\* Calcular a integral definida de -n a n \*)

desiredIntegral = c \* 2 \* n;

as=Differences[%]

(\* Imprimir o resultado \*)

```
Print["A integral definida de -", n, " a ", n, " é ", desiredIntegral];
```

```
(* Plotar o resultado *)
```

```
ListLinePlot[desiredIntegral]
```

```
ListPolarPlot[as]
```

