```python
import math
from math import import sqrt
import numpy as np
import matplotlib.pyplot as plt
import time

def prime(atester):
 k = 2
 if atester in [0, 1]: return False
 if atester in [2, 3, 5, 7]: return True
 while True:
  if k * k > atester: return True
  else:
   if atester % k == 0: return False
   else: k = k + 1

def formule1(n):
 s1 = math.log(n)
 s2 = math.log(math.log(n))
 s4 = 5/(12*math.log(n))
 s5 = 1/(24*math.log(math.log(n)))
 somme = s1+s2-1+s4+s5
 return somme

def formule2(n):
 s1 = math.log(n)
 s2 = math.log(math.log(n))
 s4 = ((math.log(math.log(n)))-2)/math.log(n)
 s5 = (((math.log(math.log(n)))**2)-(6*(math.log(math.log(n))))
+11)/(2*((math.log(n))**2))
 #print('s1 ',s1,' s2 ',s2,' s4 ',s4, ' s5 ',s5)
 somme = s1+s2-1+s4-s5
 return somme

tic=time.time()
lesp = [2]
nmax = 10000000
for k in range(3,nmax,2):
 if prime(k):
  lesp.append(k)
print('nombres premiers', lesp)
pix = len(lesp)
print(pix)
for k in range(pix-20,pix):
 print(k,'ieme nombre premier par la formule 1 = ',formule1(k)*k)
 print(k,'ieme nombre premier par la formule 2 = ',formule2(k)*k)
 print(0.5*k*(formule1(k)+formule2(k)))
 print('vrai ', k,' ieme nombre premier = ',lesp[k-2])
```