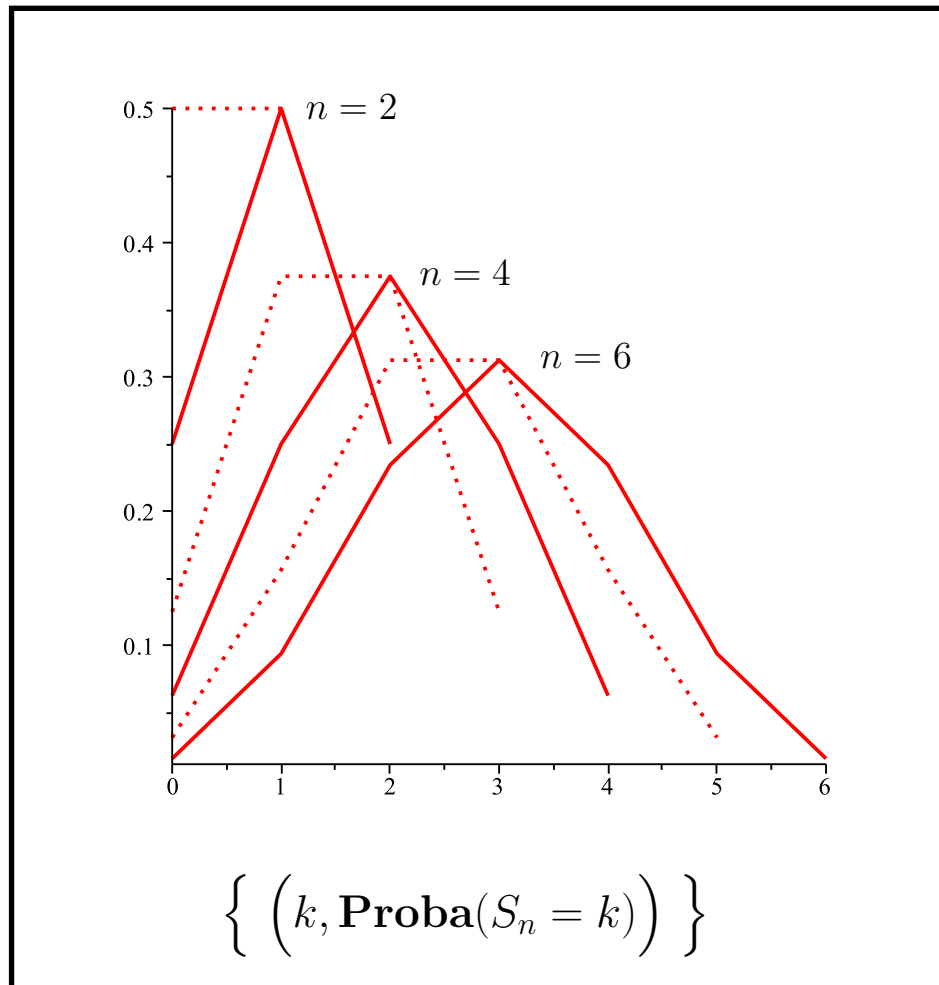
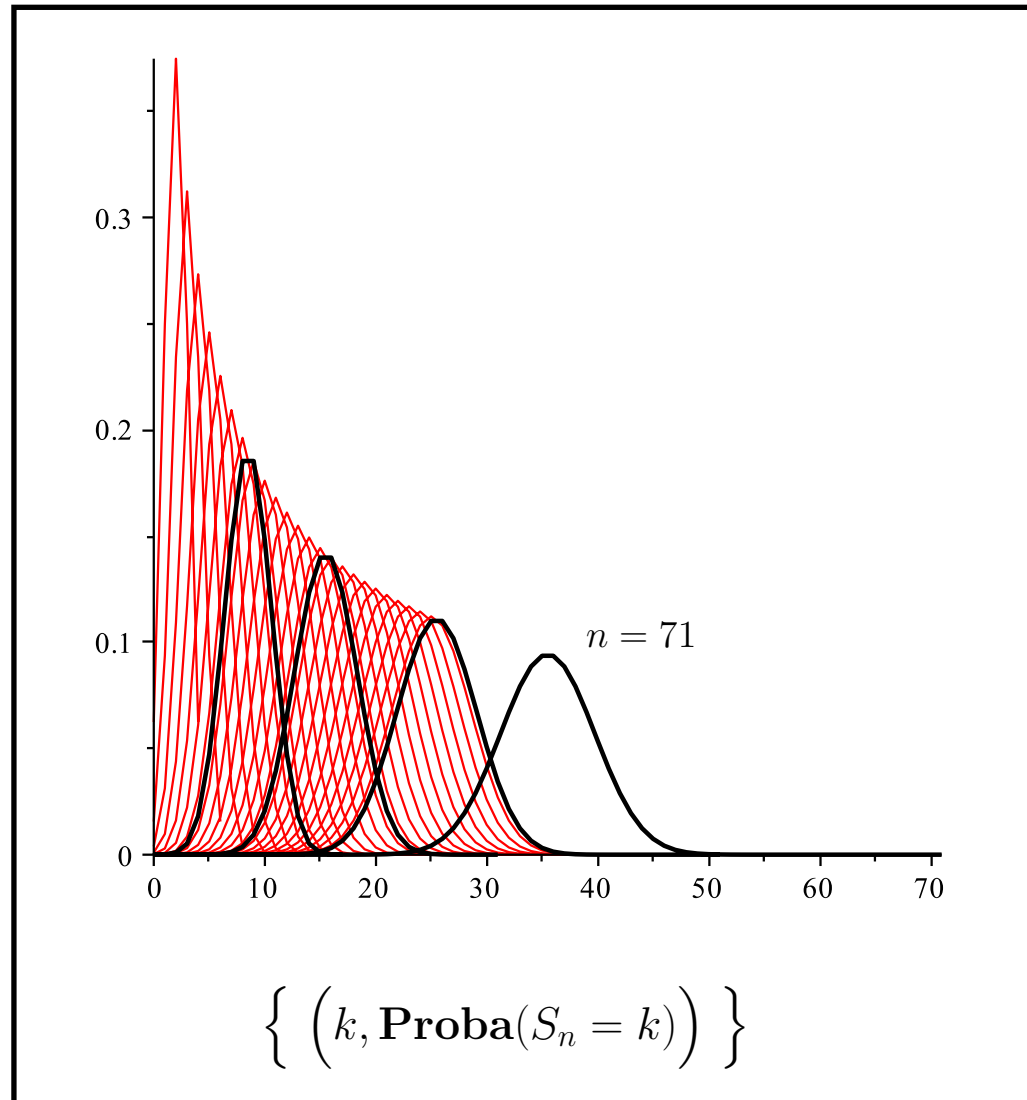
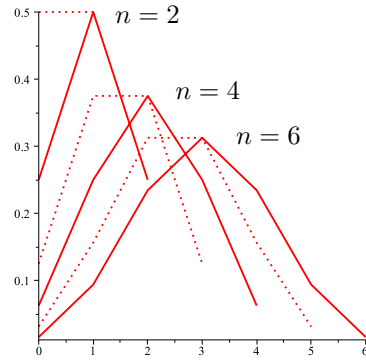


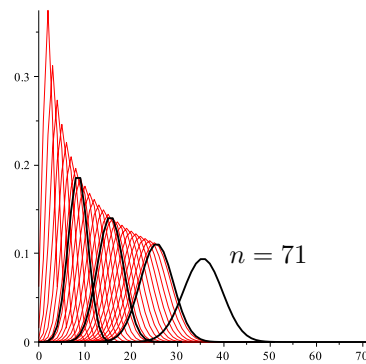
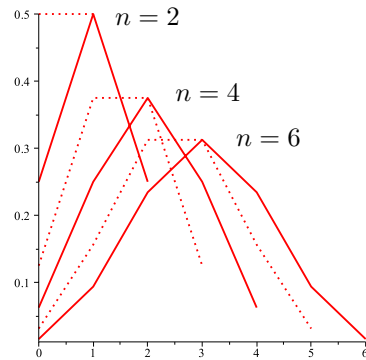
n jets à pile ou face : distribution des gains (1)



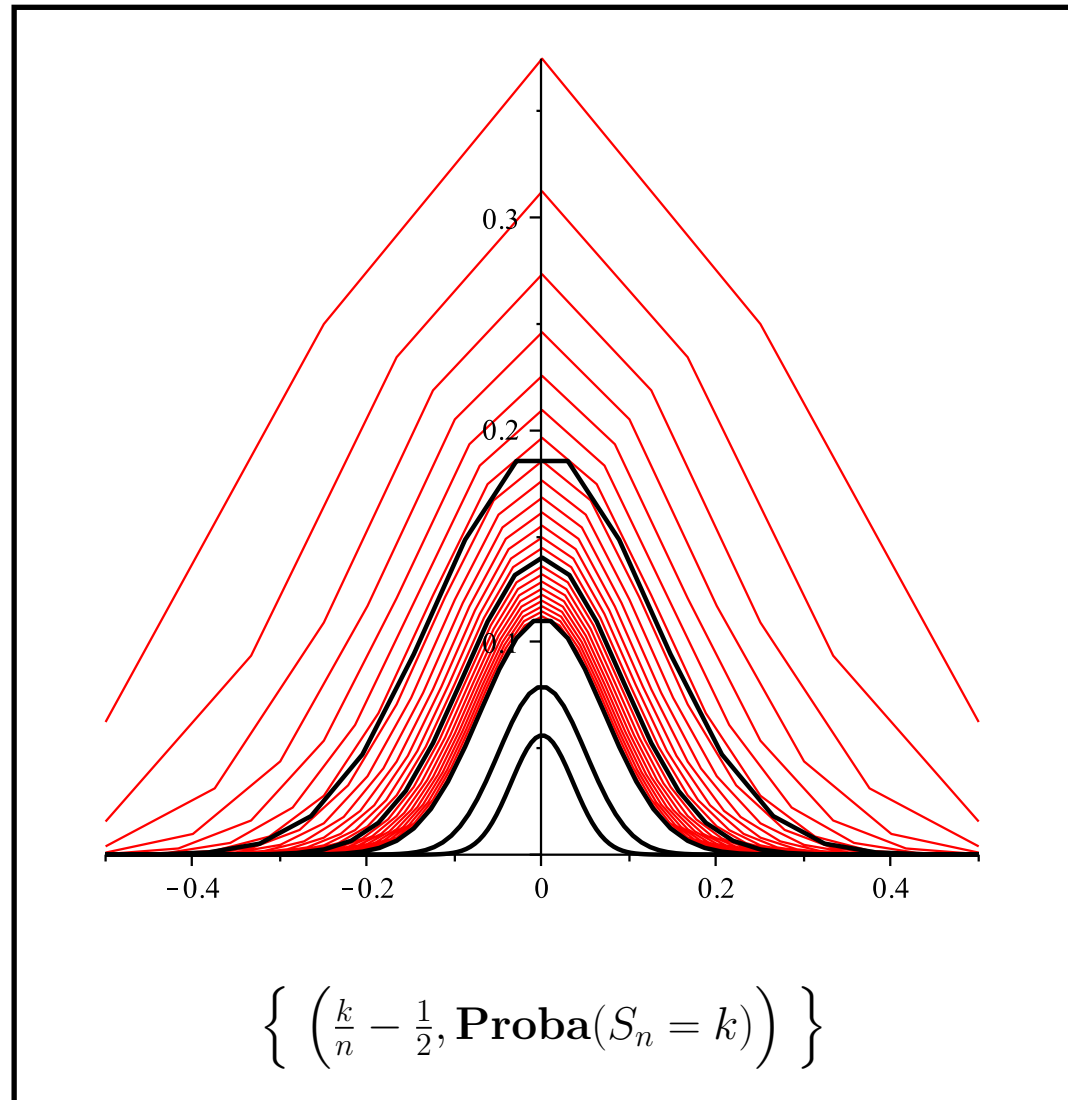
n jets à pile ou face : distribution des gains (2)



n jets à pile ou face : distribution des gains (3)

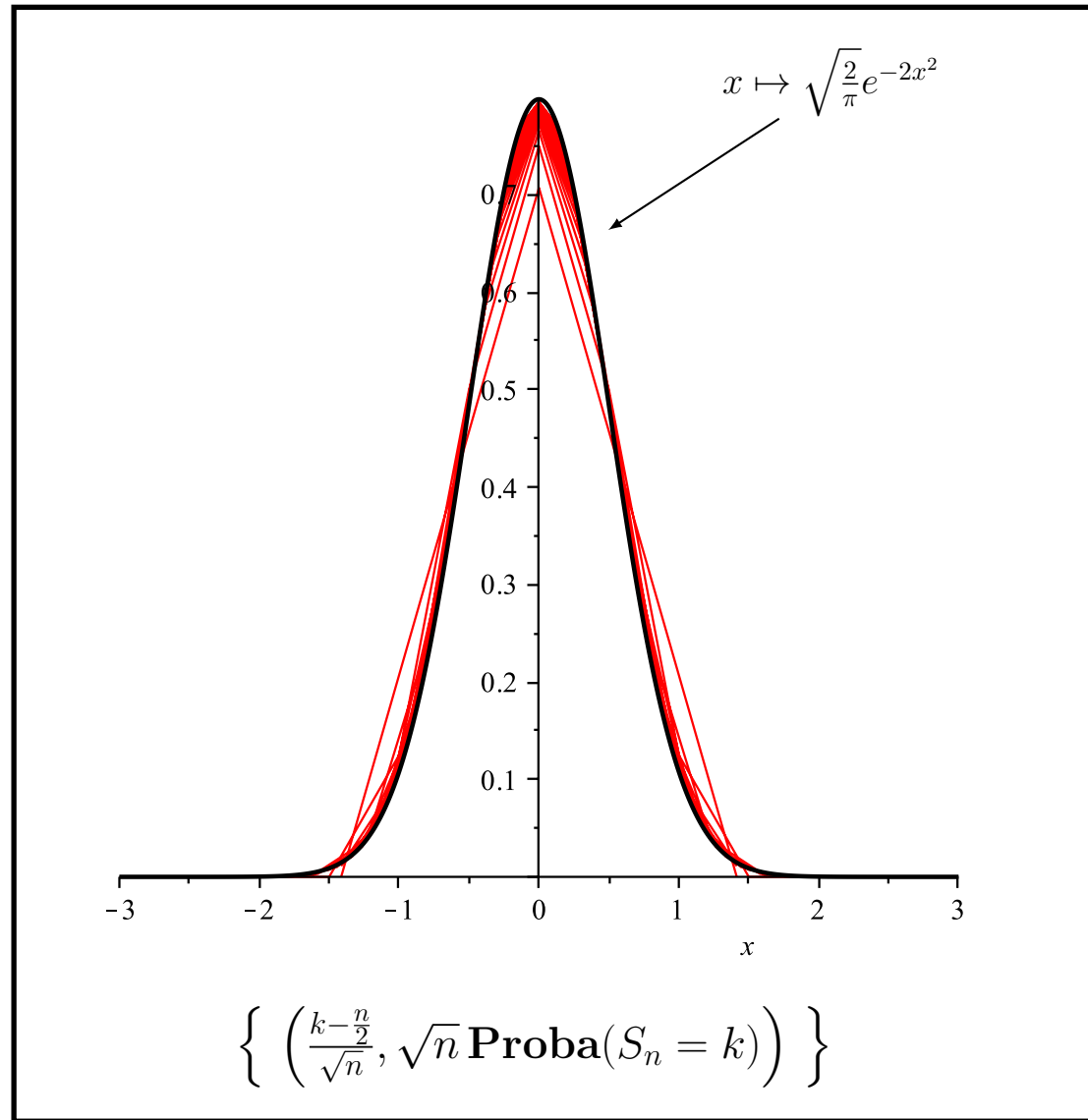
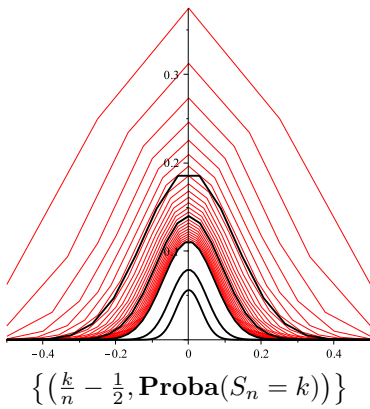
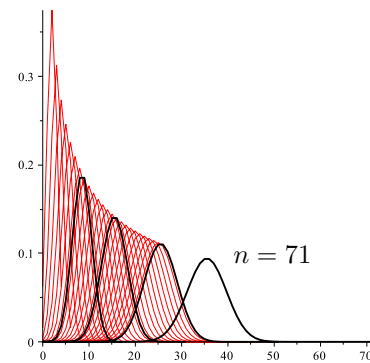
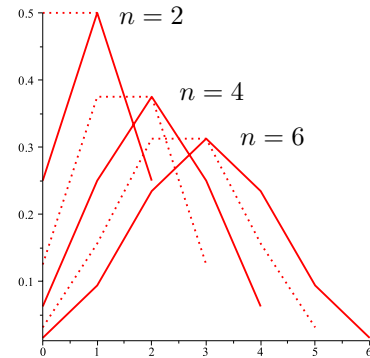


$$\left\{ \left(k, \text{Proba}(S_n = k) \right) \right\}$$



$$\left\{ \left(\frac{k}{n} - \frac{1}{2}, \text{Proba}(S_n = k) \right) \right\}$$

n jets à pile ou face : distribution des gains (4)



Somme des carrés des inverses (1)

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \frac{1}{6^2} + \dots = ???$$

Somme des carrés des inverses (2)

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \frac{1}{6^2} + \dots = ?$$

Deux termes : $1 + \frac{1}{2^2} = \frac{5}{4} = 1,25$

Somme des carrés des inverses (3)

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \frac{1}{6^2} + \dots = ?$$

Trois termes : $1 + \frac{1}{2^2} + \frac{1}{3^2} = \frac{49}{36} \approx 1,3611111111$

Quatre termes : $1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} = \frac{205}{144} \approx 1,4236111111$

Dix termes : $1 + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{10^2} = \frac{1968329}{1968329} \approx 1.644934068$

Et après ???

Somme des carrés des inverses (4)

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \frac{1}{6^2} + \dots = ?$$

Cent termes : $1 + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{100^2} \approx 1.634983900$

Mille termes : $1 + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{1000^2} \approx 1.643934568$

Un million de termes : $1 + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{(10^6)^2} \approx 1.644933068$

Bon, et après ?

Somme des carrés des inverses (5)

$$\sqrt{6 \times \left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \dots \right)} = ???$$

Somme des carrés des inverses (6)

$$\sqrt{6 \times \left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \dots\right)} = ?$$

Cent termes : $\sqrt{6 \times \left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{100^2}\right)} \approx 3.132076531$

Mille termes : $\sqrt{6 \times \left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{1000^2}\right)} \approx 3.140638057$

Un million : $\sqrt{6 \times \left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{(10^6)^2}\right)} \approx 3.141591699$

Somme des carrés des inverses (7)

Un milliard de termes :

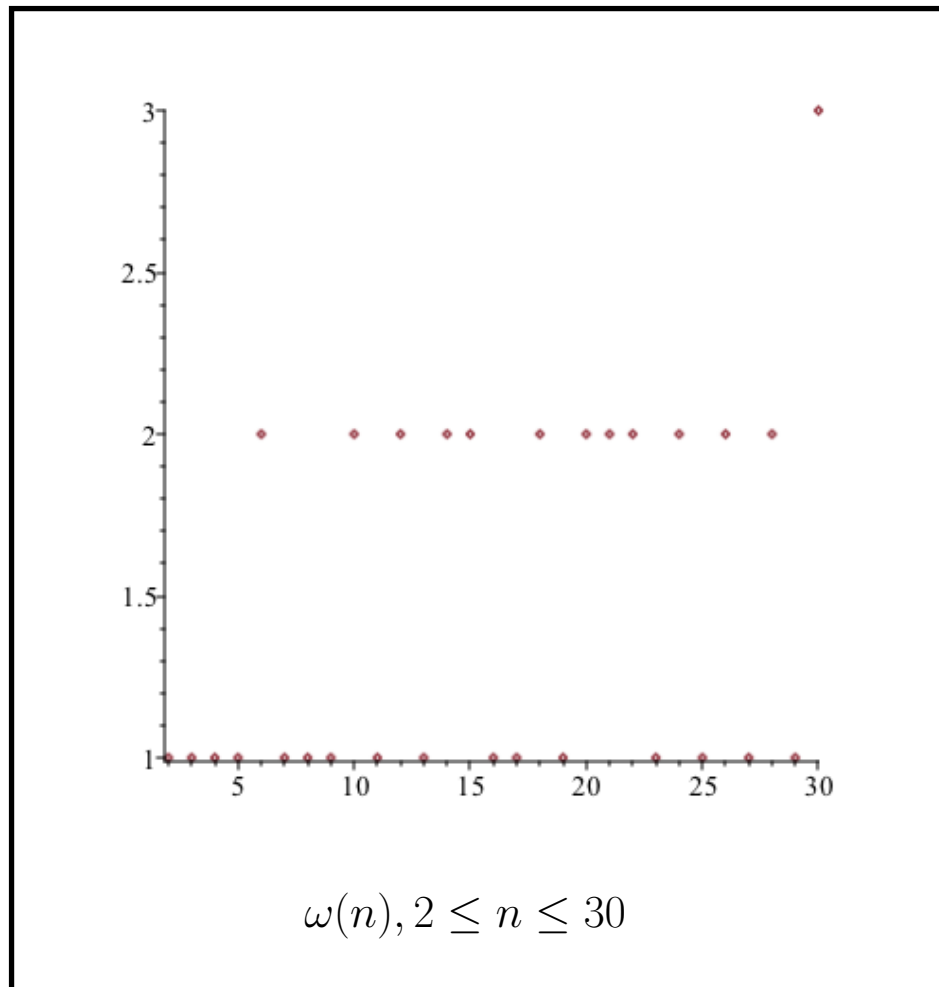
$$\sqrt{6 \times \left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \cdots + \frac{1}{(10^6)^2} \right)} \approx 3.14159265263486$$

A vrai dire, en convergeant très lentement,

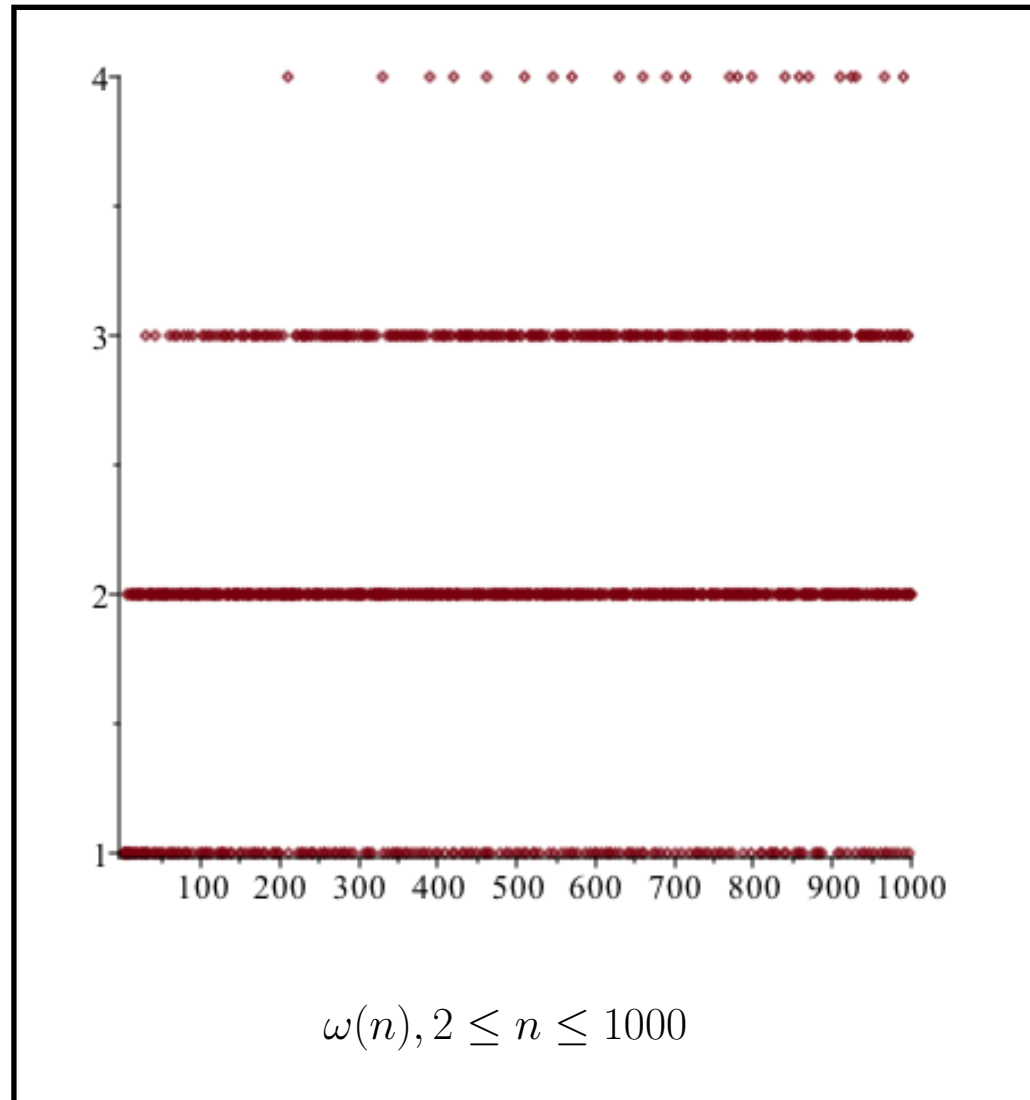
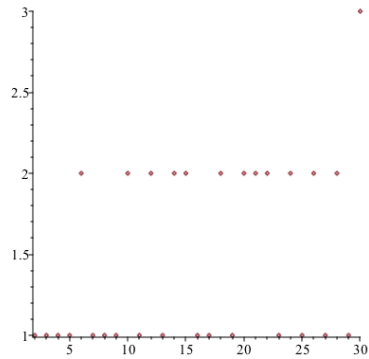
$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \frac{1}{6^2} + \cdots = \frac{\pi^2}{6}$$

Combien de facteurs premiers ? (1)

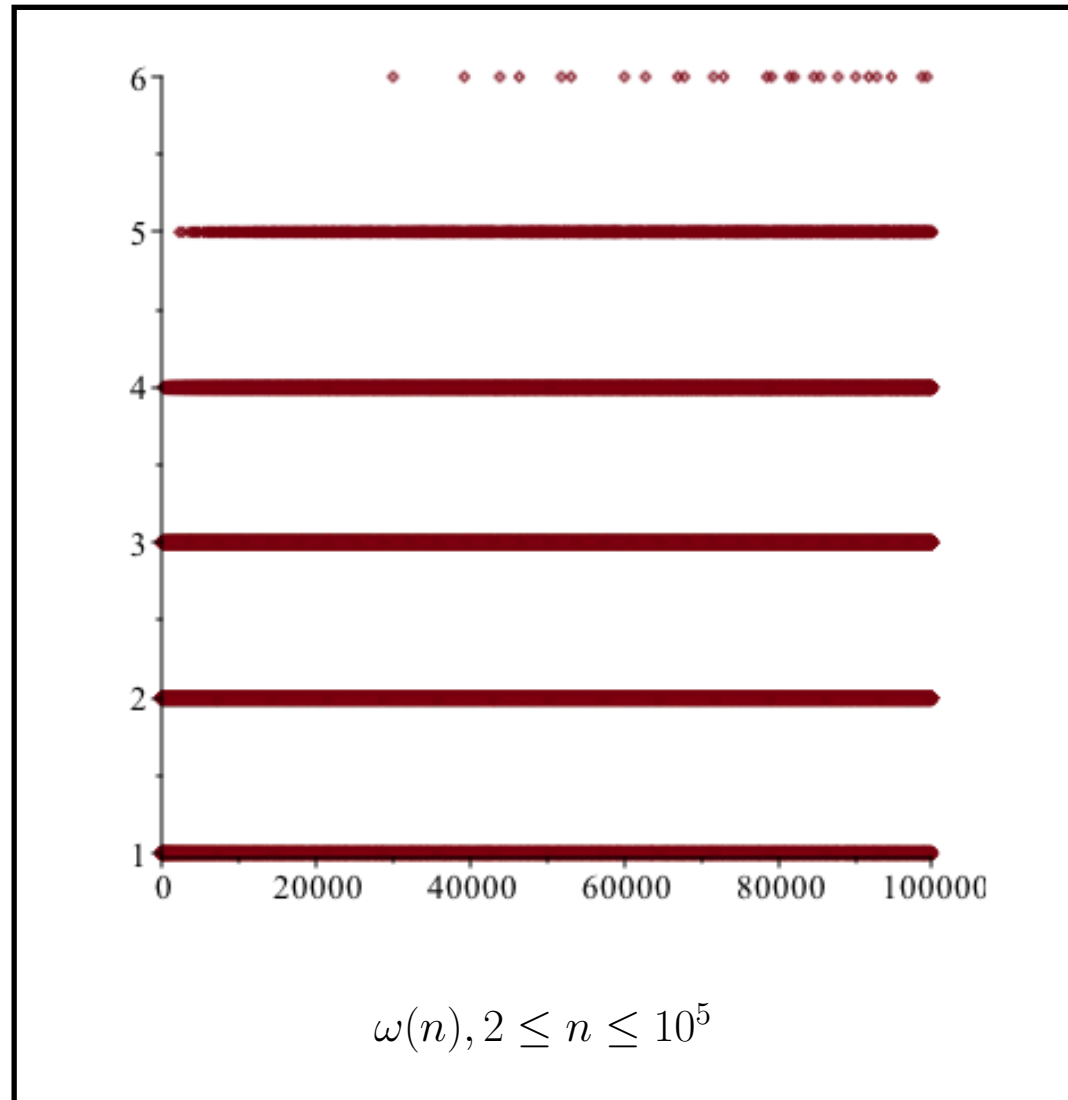
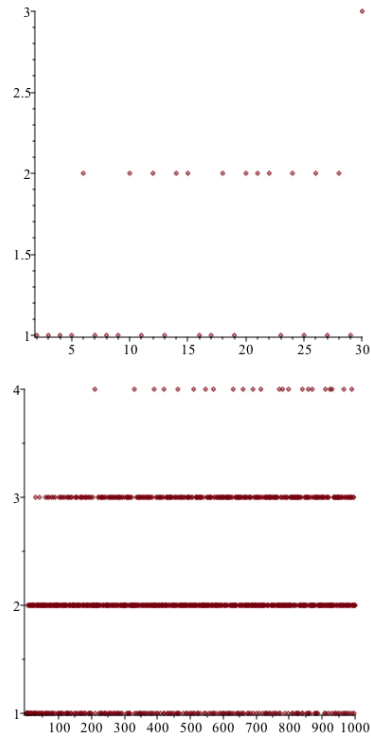
$\omega(n)$ est le nombre de facteurs premiers distincts de n .



Combien de facteurs premiers ? (2)

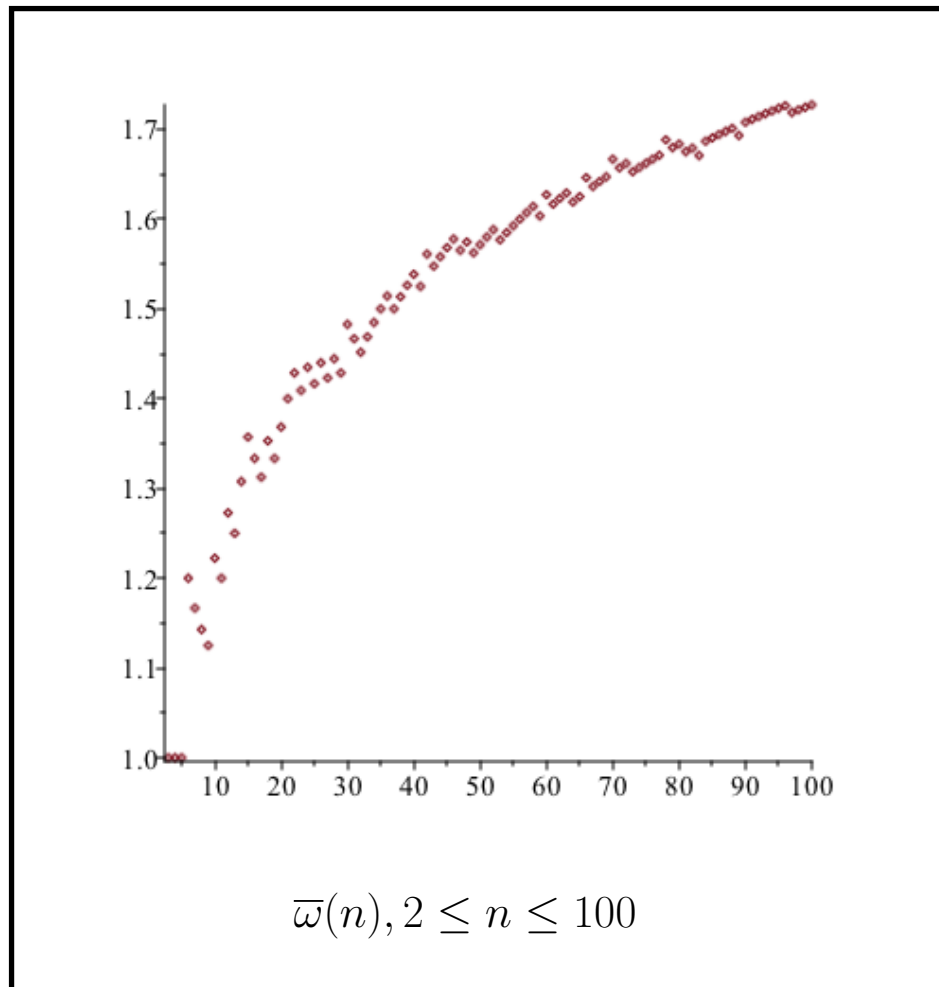


Combien de facteurs premiers ? (3)

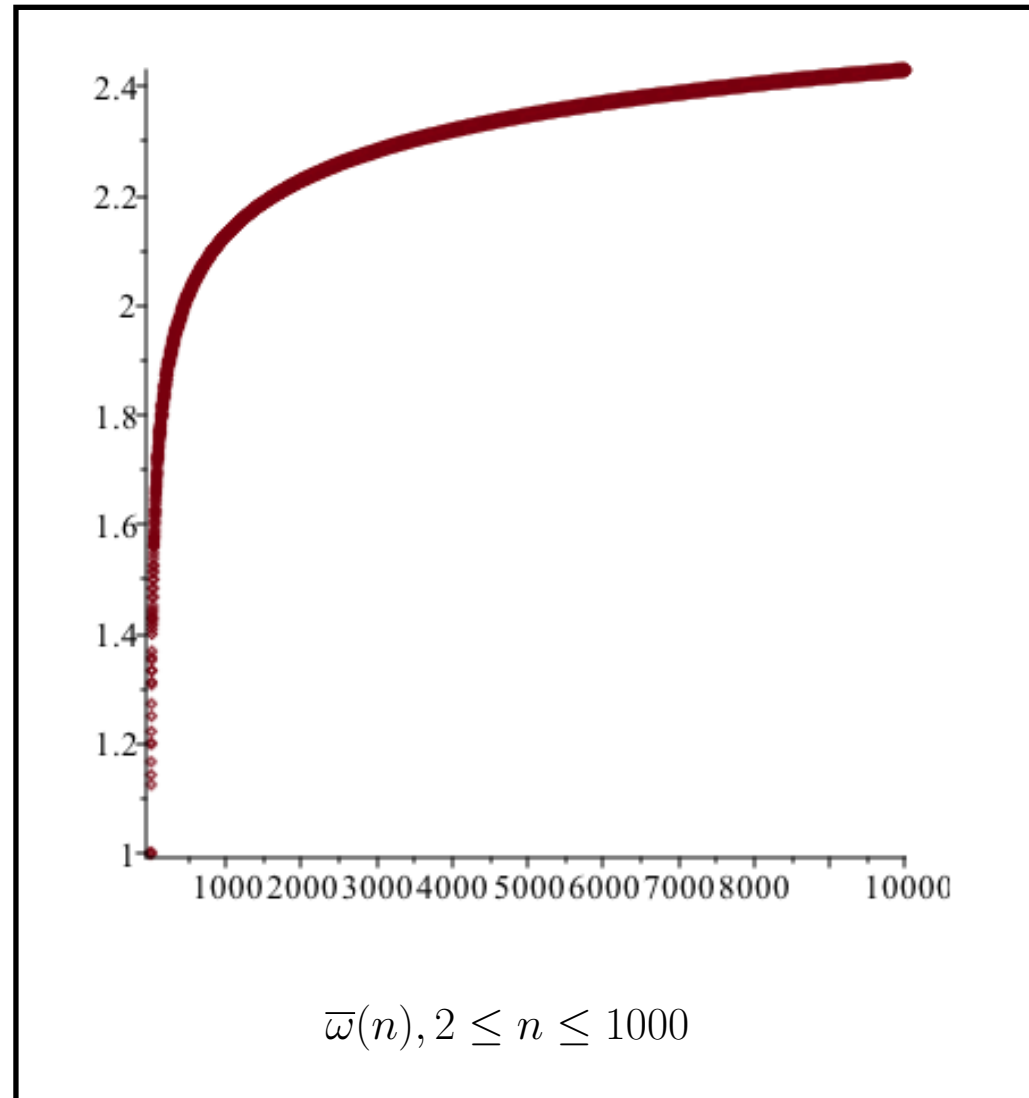
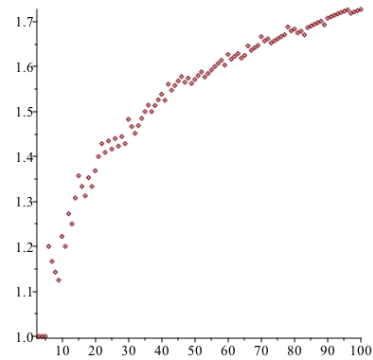


Combien de facteurs premiers ? (4)

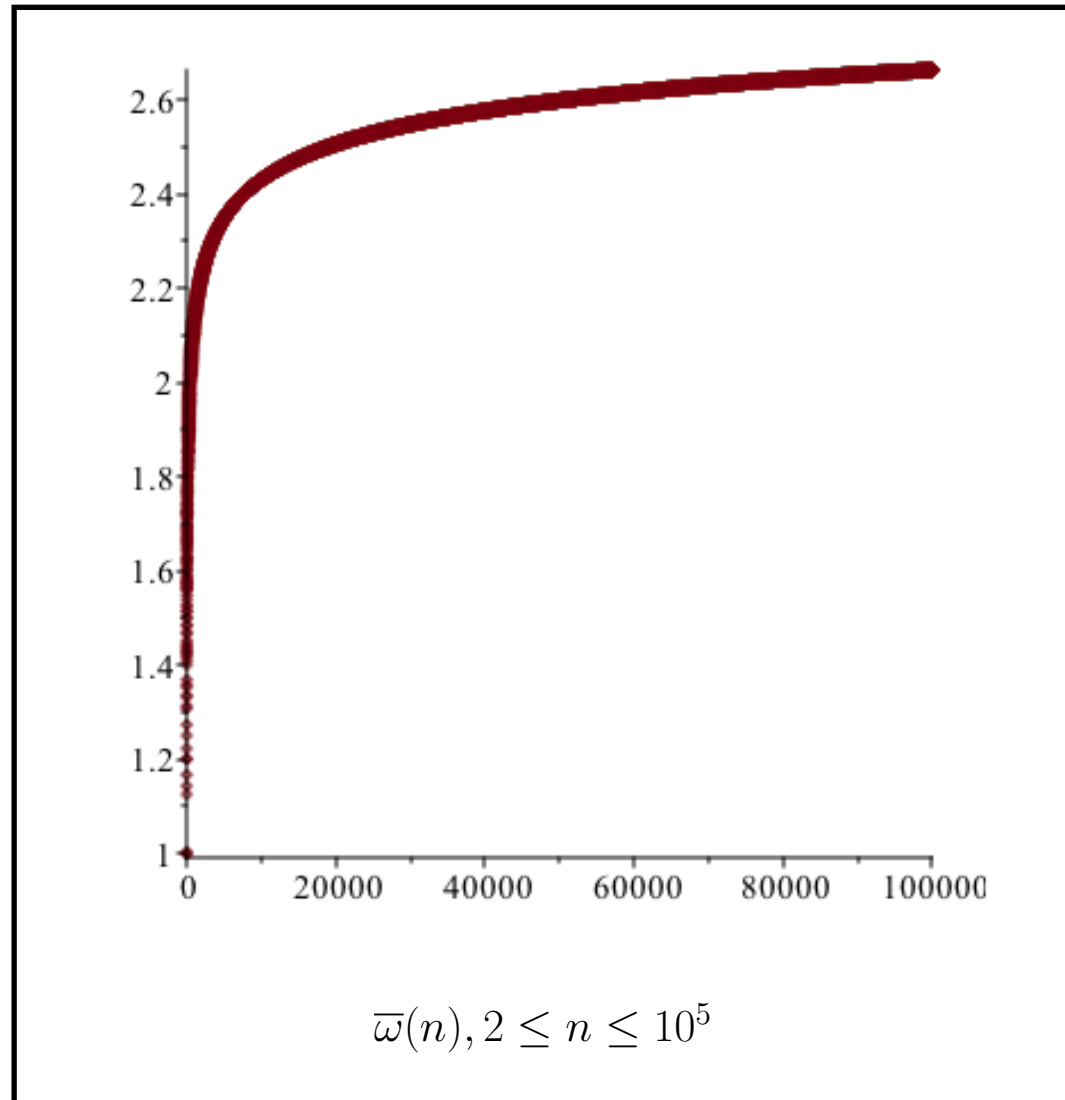
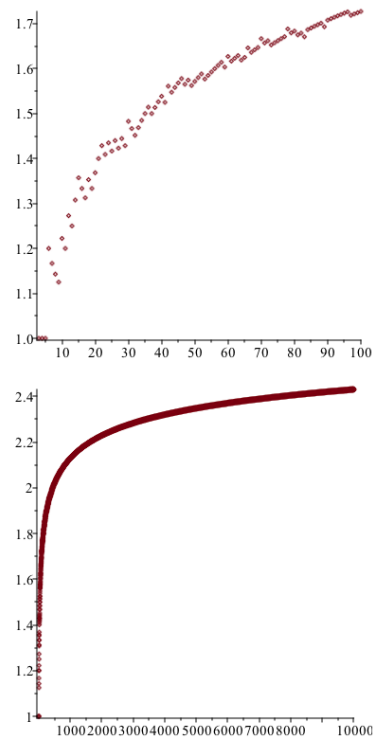
$\bar{\omega}(n)$ est la moyenne des $\omega(k)$, $2 \leq k \leq n$.



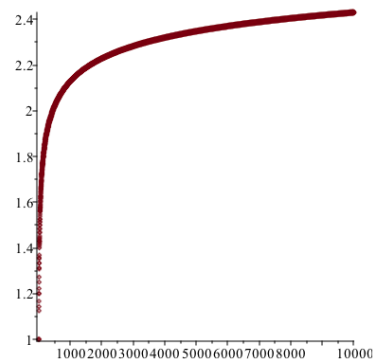
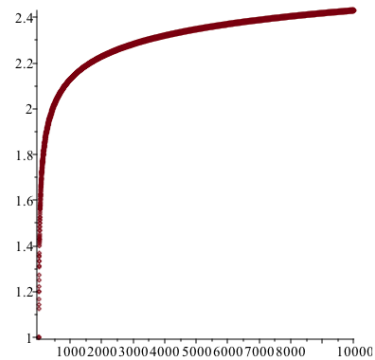
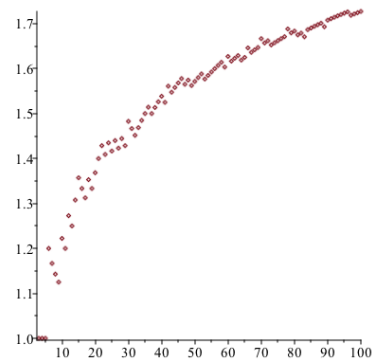
Combien de facteurs premiers ? (5)



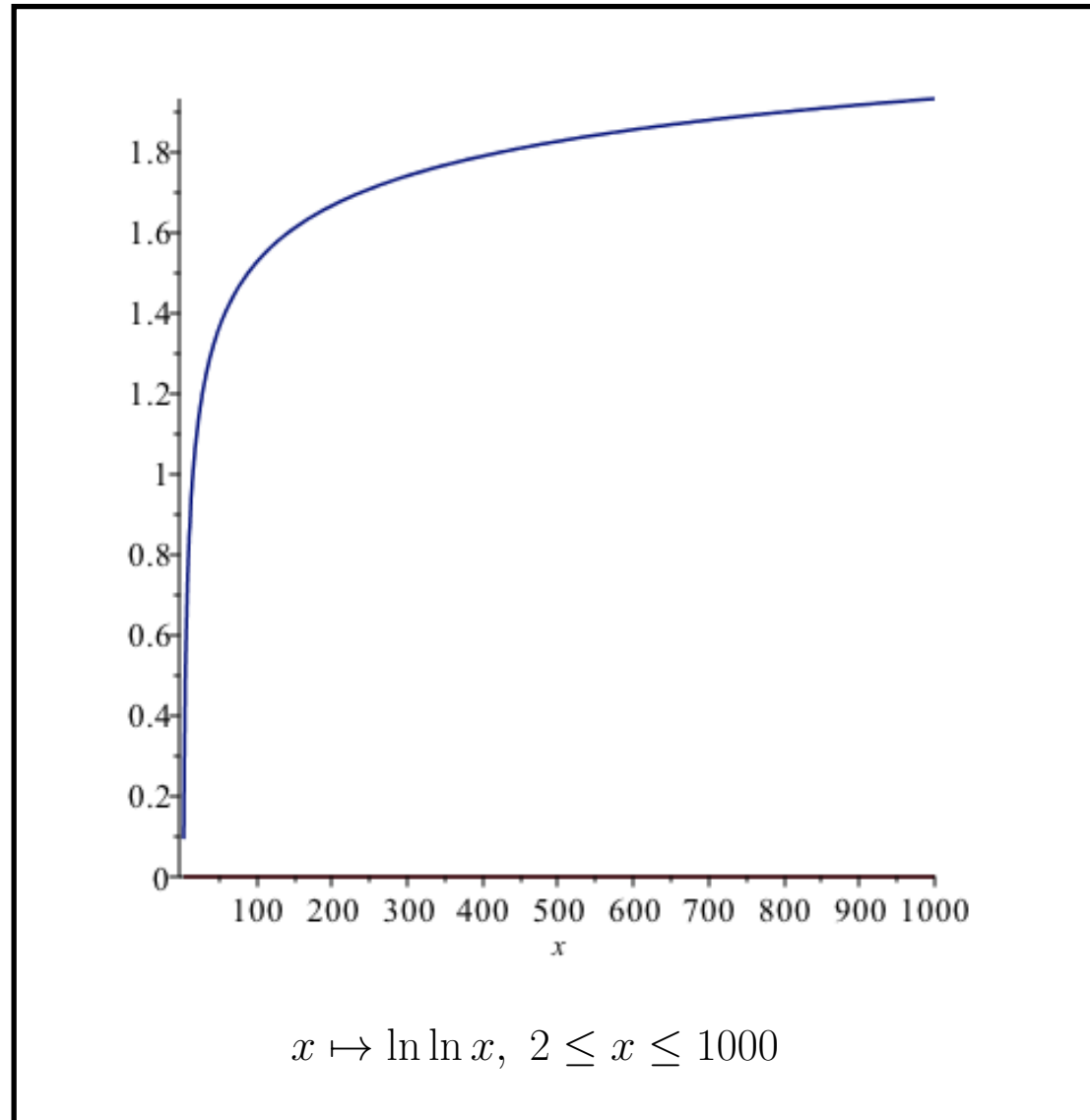
Combien de facteurs premiers ? (6)



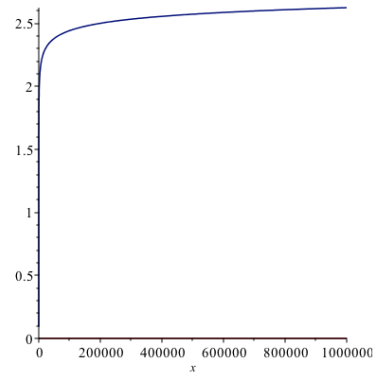
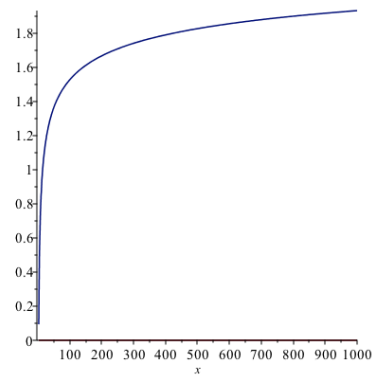
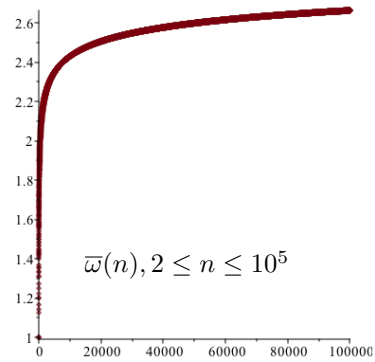
Combien de facteurs premiers ? (7)



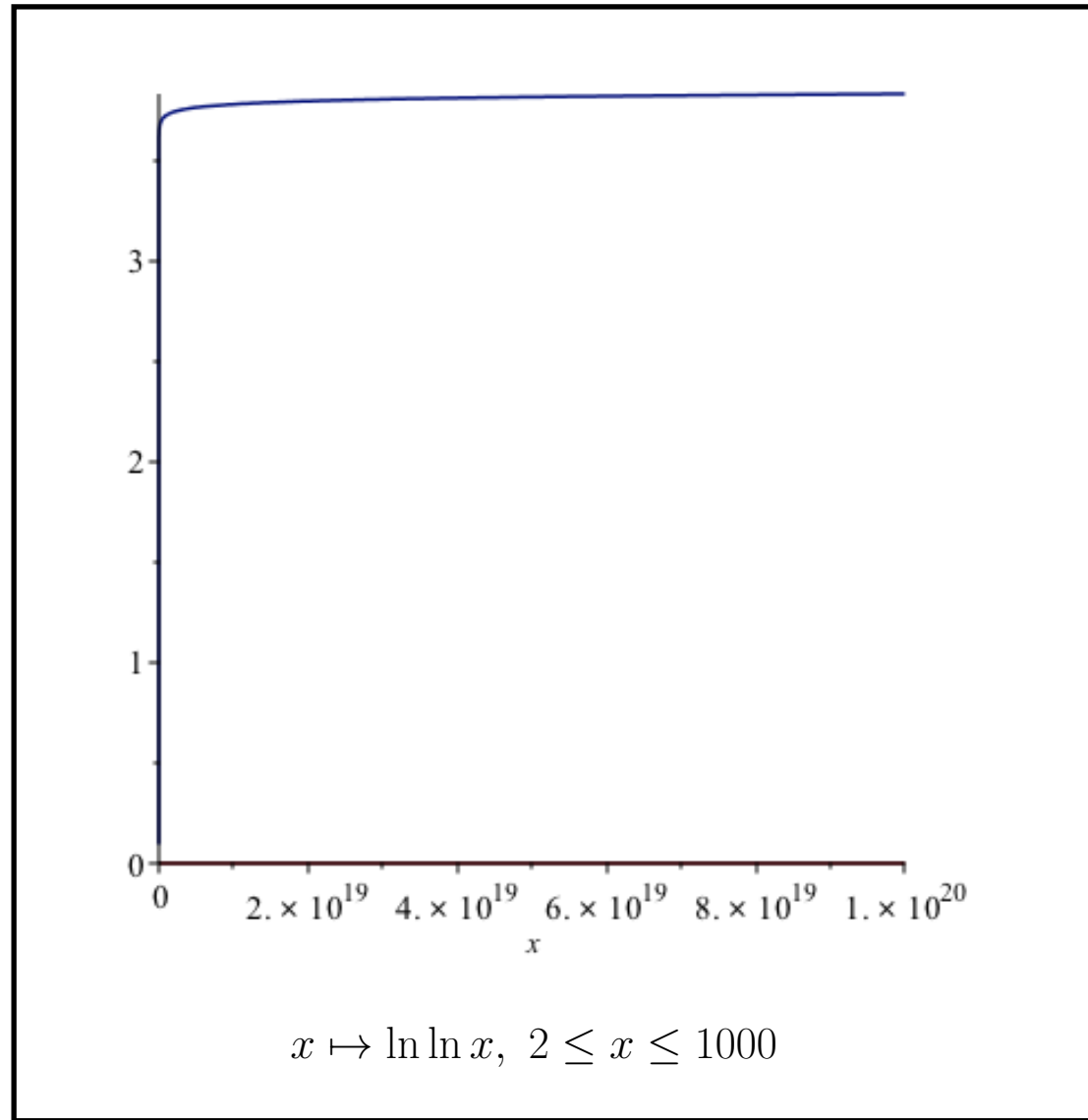
$\bar{w}(n), 2 \leq n \leq 10^5$



Combien de facteurs premiers ? (8)

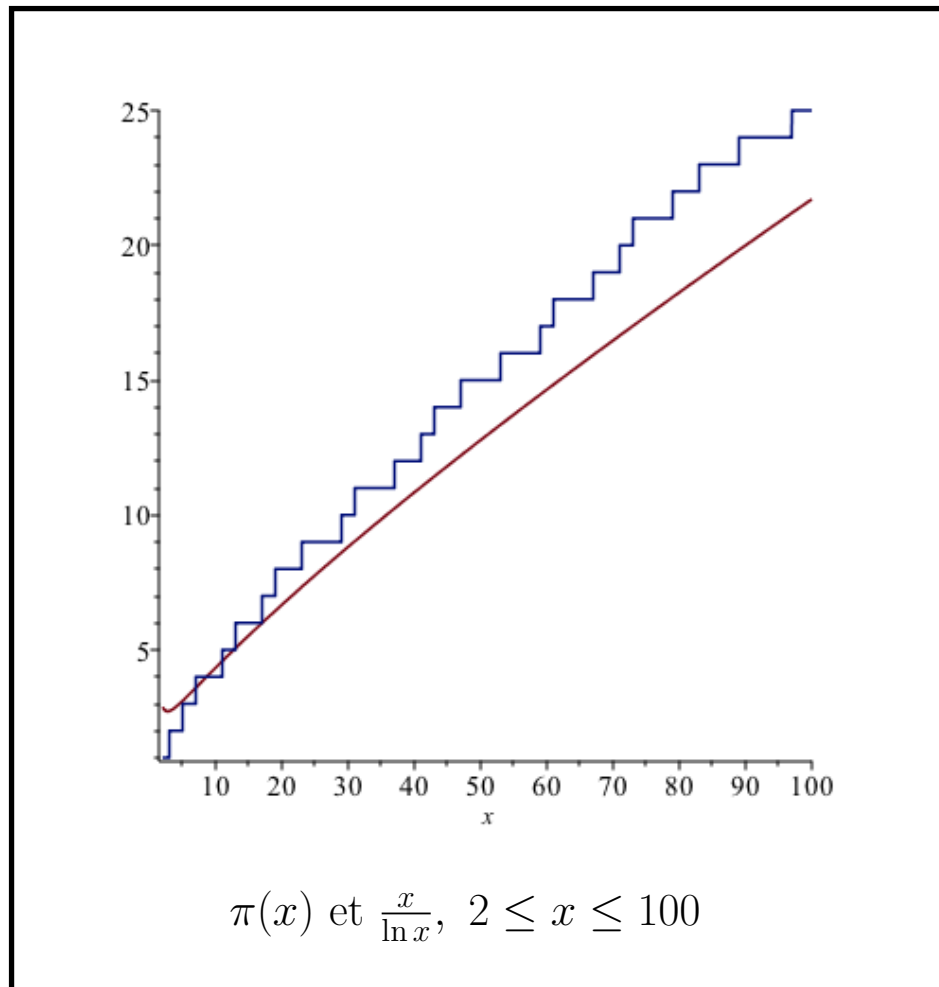


$x \mapsto \ln \ln x$

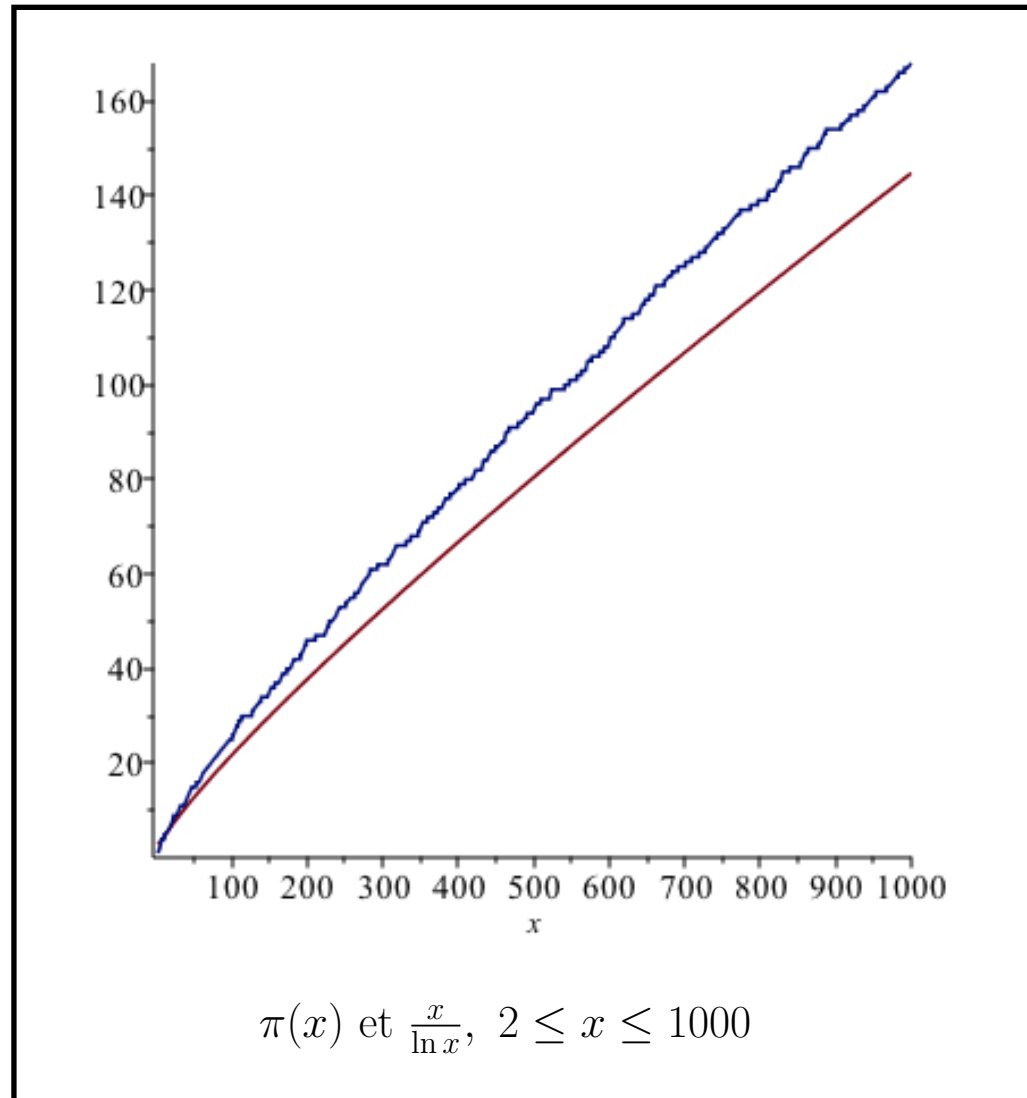
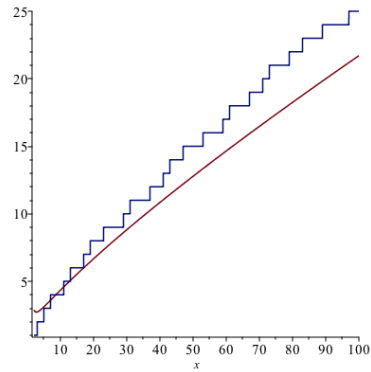


Fonction π (1)

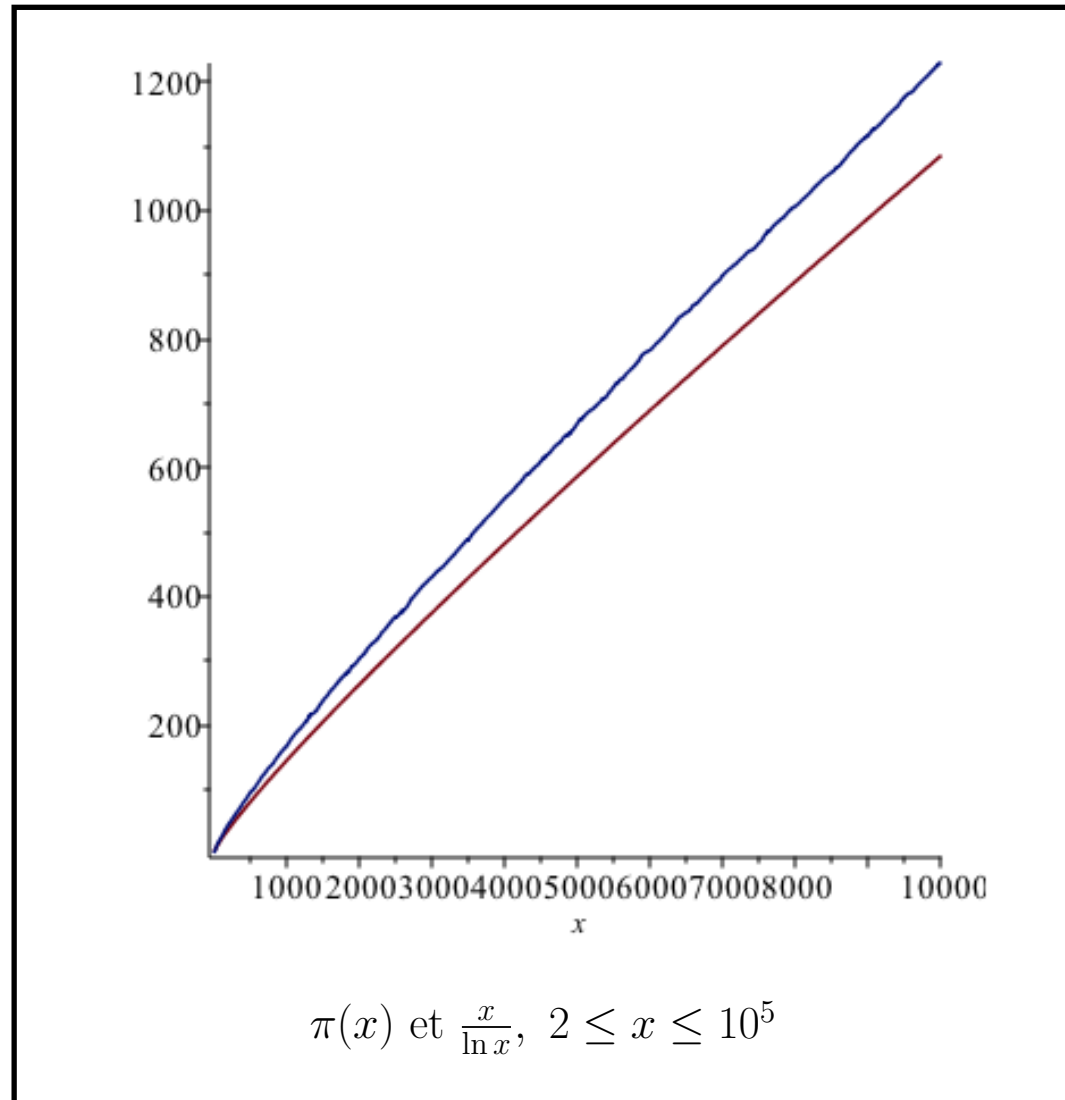
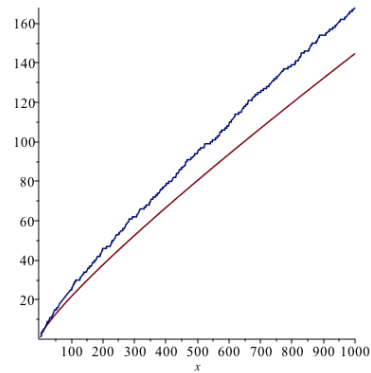
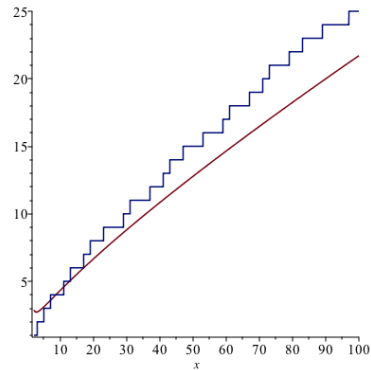
$\pi(x)$ est le nombre de nombres premiers $\leq x$.



Fonction π (2)

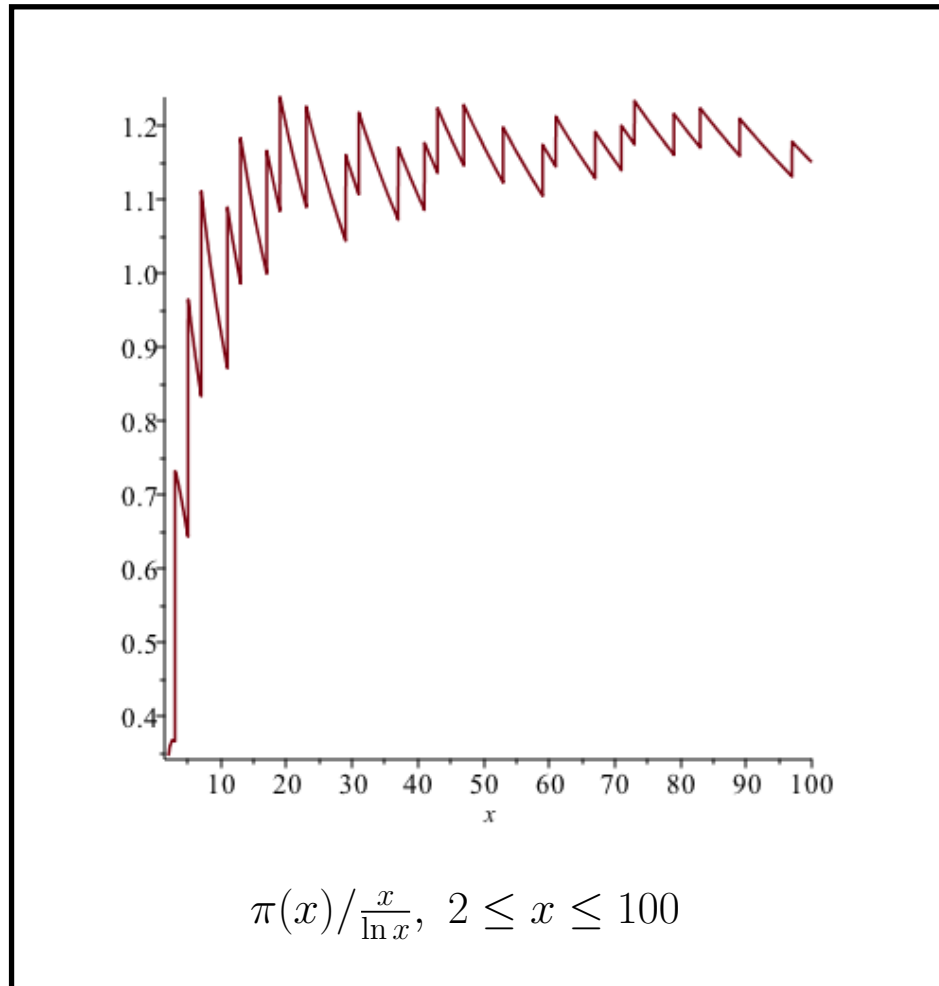


Fonction π (3)

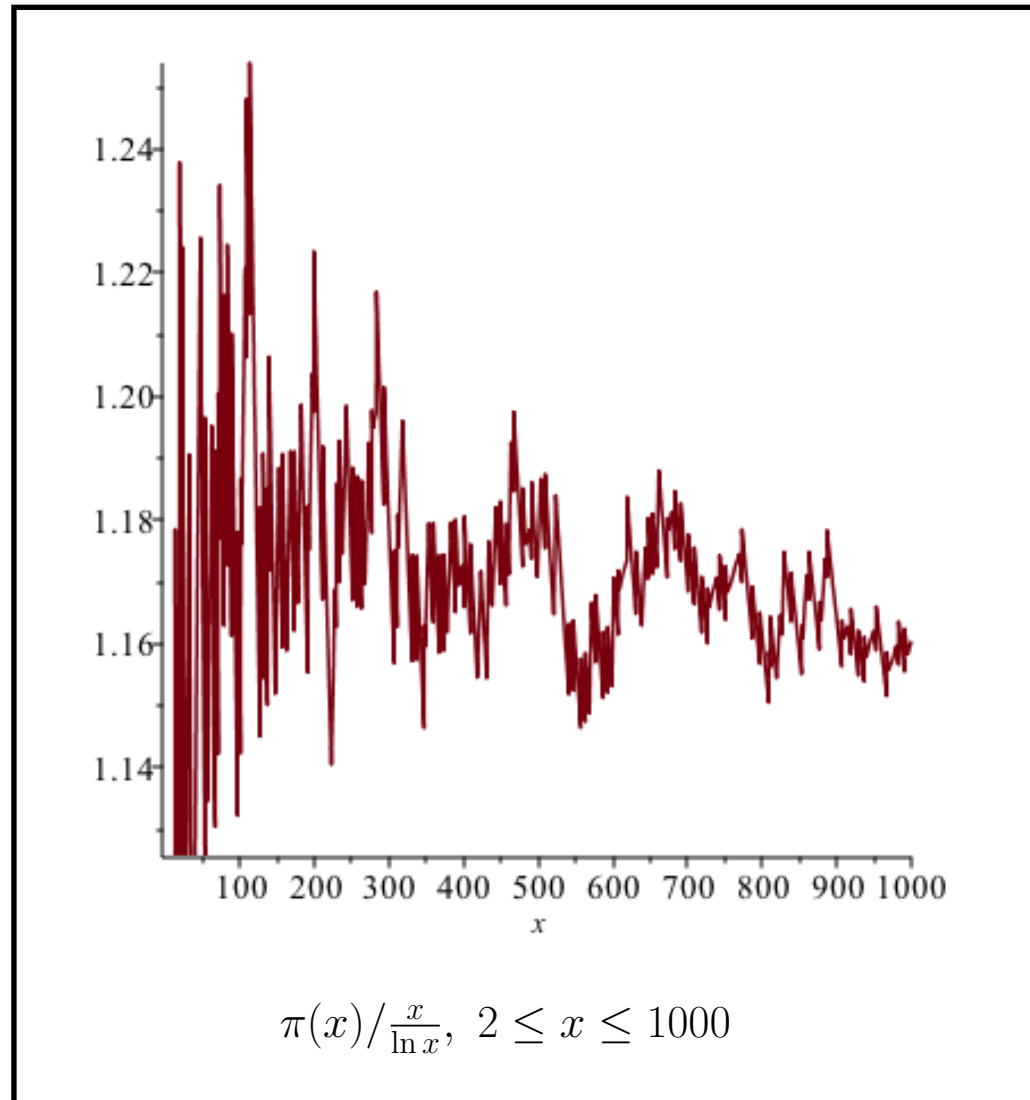
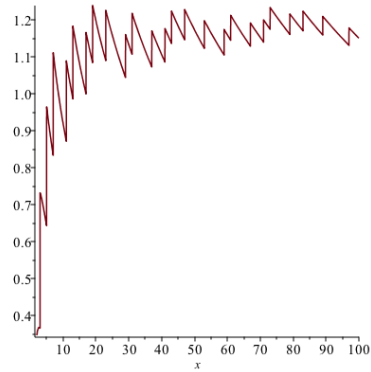


Fonction π (4)

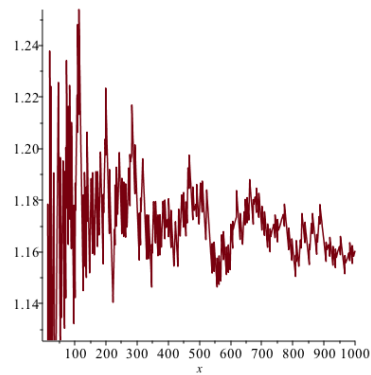
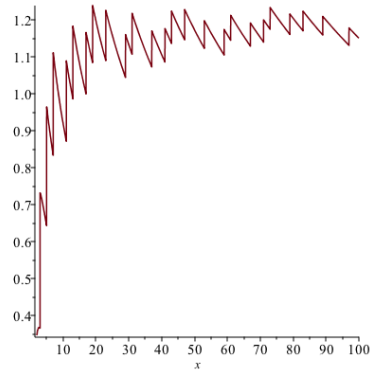
$\pi(x) \sim \frac{x}{\ln x}$ lorsque x tend vers $+\infty$.



Fonction π (5)



Fonction π (6)



$\pi(x)/\frac{x}{\ln x} \rightarrow 1$
lorsque $x \rightarrow +\infty$,
mais... lentement !

