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import matplotlib.pyplot as plt, numpy as np

P = np.array([3,5,7,11,13])
precision = 51
aallpphhaa = np.linspace(0, 1, precision)[1:precision-1]
                # exclut les extremités 0 et 1 de l'intervalle unite
S = -aallpphhaa*np.log(aallpphhaa)-(1-aallpphhaa)*np.log(1-aallpphhaa)
w = np.exp(S)
M = np.array([[w[k]*(p**aallpphhaa[k])*(q**(1-aallpphhaa[k])) for p in P for q
in P] for k in range(len(aallpphhaa))])
k = np.argmax(M, axis=0)
plt.plot(M)
plt.scatter(k, M[k, np.arange(M.shape[1])], c='red')
plt.xlabel('utiliser l'entropie pour calculer des sommes ')
plt.xticks([])
plt.yticks(range(4,26,2))
plt.grid()
plt.show()

```