

②

$$\sum_{k=1}^n \ln\left(1 + \frac{a}{bk}\right) \sim \sum_{k=1}^n \frac{a}{bk} \sim \frac{a}{b} \ln(n)$$

done

Exercice 91 (Mlyne)

Qma:

$$j = e^{\frac{2i\pi}{3}}$$

$$e^1 + e^j + e^{j^2} = \sum_{n=0}^{+\infty} \frac{1 + j^n + j^{2n}}{n!}$$

$$\text{Or } 1 + j + j^2 = \frac{j^3 - 1}{j - 1} = 0 \quad (j^3 = 1)$$

$$\text{Pour } j^n \neq 1$$

$$\iff n \equiv 0 [3]$$

$$(j^n)^0 + (j^n)^1 + (j^n)^2 = 3$$

$$\text{d'où : } e + e^j + e^{j^2} = \sum_{n=0}^{+\infty} \frac{3}{(3n)!}$$

$$\sum_{n=0}^{+\infty} \frac{1}{(3n)!} = \frac{e^1 + e^j + e^{j^2}}{3}$$

$$= \frac{1}{3} \left[e^1 + e^{\cos(\frac{2\pi}{3})} \times 2 \cos\left(\sin\left(\frac{2\pi}{3}\right)\right) \right]$$

angle maître.