Formulaire pour le contrôle 1

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Licence 1 - Semestre 2

$$\sum_{n=0}^{+\infty} x^n = \frac{1}{1-x} \text{ si } |x| < 1$$

$$\sum_{n=0}^{+\infty} nq^{n-1} = \frac{1}{(1-q)^2} \text{ si } |q| < 1$$

$$\sum_{n=0}^{+\infty} nx^n = \frac{x}{(1-x)^2} \text{ si } |x| < 1$$

$$\sum_{n=0}^{+\infty} n(n-1)q^{n-2} = \frac{2}{(1-q)^3} \text{ si } |q| < 1$$

$$\sum_{n=0}^{+\infty} n^2x^n = \frac{x^2+x}{(1-x)^3} \text{ si } |x| < 1$$

$$\sum_{n=0}^{+\infty} \frac{x^n}{n!} = e^x$$

$$\ln(1+h) \underset{0}{\sim} h$$

$$\sin h \underset{0}{\sim} h$$

$$e^h - 1 \underset{0}{\sim} h$$

$$\tan h \underset{0}{\sim} h$$

$$\sqrt{1+h} - 1 \underset{0}{\sim} \frac{1}{2}h$$

$$1 - \cos h \underset{0}{\sim} \frac{1}{2}h^2$$

$$\frac{1}{1-h} = 1 + h + h^2 + h^3 + h^4 + o\left(h^4\right)$$

$$\frac{1}{1+h} = 1 - h + h^2 - h^3 + h^4 + o\left(h^4\right)$$

$$\ln(1+h) = h - \frac{h^2}{2} + \frac{h^3}{3} - \frac{h^4}{4} + o\left(h^4\right)$$

$$\ln(1-h) = -h - \frac{h^2}{2} - \frac{h^3}{3} - \frac{h^4}{4} + o\left(h^4\right)$$

$$e^h = 1 + h + \frac{h^2}{2} + \frac{h^3}{6} + \frac{h^4}{24} + o(h^4)$$

$$(1+h)^a = 1 + ah + \frac{a(a-1)}{2}h^2 + \frac{a(a-1)(a-2)}{6}h^3 + \frac{a(a-1)(a-2)(a-3)}{24}h^4 + o\left(h^4\right) \text{ où } a \in \mathbb{R}.$$

$$\sqrt{1+h} = 1 + \frac{1}{2}h - \frac{1}{8}h^2 + \frac{1}{16}h^3 - \frac{5}{128}h^4 + o\left(h^4\right)$$

$$\sin h = h - \frac{h^3}{6} + o\left(h^4\right)$$

$$\cos h = 1 - \frac{h^2}{2} + \frac{h^4}{24} + o\left(h^4\right)$$

$$\tan h = h + \frac{1}{3}h^3 + o\left(h^4\right)$$