

CALCUL INTÉGRAL

Primitives de fonctions usuelles – Série 1

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<https://bit.ly/3ZF3ThE>



Calcule :

$$\begin{aligned}(1) \int (5x^2 - 8x + 3) dx &= \frac{5x^3}{3} - 8 \frac{x^2}{2} + 3x + C \\ &= \frac{5x^3}{3} - 4x^2 + 3x + C\end{aligned}$$

$$\begin{aligned}(2) \int \frac{-4}{3x^5} dx &= \int -\frac{4}{3} x^{-5} dx = -\frac{4}{3} \cdot \frac{x^{-4}}{-4} + C \\ &= \frac{1}{3x^4} + C\end{aligned}$$

$$\begin{aligned}(3) \int (2x - 6) dx &= 2 \frac{x^2}{2} - 6x + C \\ &= x^2 - 6x + C\end{aligned}$$

$$\begin{aligned}(4) \int (9 + x)^2 dx &= \int (81 + 18x + x^2) dx \\ &= 81x + 18 \frac{x^2}{2} + \frac{x^3}{3} + C \\ &= 81x + 9x^2 + \frac{x^3}{3} + C\end{aligned}$$

$$\begin{aligned}(5) \int (1 + 3t) \cdot t^2 dt &= \int (t^2 + 3t^3) dt \\ &= \frac{t^3}{3} + 3 \cdot \frac{t^4}{4} + C\end{aligned}$$

$$\begin{aligned}(6) \int \frac{x^2 + 4}{x} dx &= \int \left(x + \frac{4}{x}\right) dx \\ &= \frac{x^2}{2} + 4 \ln|x| + C\end{aligned}$$

$$\begin{aligned}
 (7) \int \frac{1}{u\sqrt{u}} du &= \int \frac{1}{u \cdot u^{1/2}} du = \int \frac{1}{u^{3/2}} du = \int u^{-3/2} du \\
 &= \frac{u^{-1/2}}{-1/2} + C = \frac{-2}{\sqrt{u}} + C
 \end{aligned}$$

$$\begin{aligned}
 (8) \int \frac{x^2 + 4x - 3}{\sqrt{x}} dx &= \int (x^{3/2} + 4 \cdot x^{1/2} - 3 \cdot x^{-1/2}) dx \\
 &= \frac{x^{5/2}}{5/2} + 4 \cdot \frac{x^{3/2}}{3/2} - 3 \cdot \frac{x^{1/2}}{1/2} + C \\
 &= \frac{2}{5} \sqrt{x^5} + \frac{8}{3} \sqrt{x^3} - 6 \sqrt{x} + C
 \end{aligned}$$

$$\begin{aligned}
 (9) \int \left(\sqrt{x} + \frac{1}{3\sqrt{x}} \right) dx &= \int (x^{1/2} + \frac{1}{3} \cdot x^{-1/2}) dx \\
 &= \frac{x^{3/2}}{3/2} + \frac{1}{3} \cdot \frac{x^{1/2}}{1/2} + C \\
 &= \frac{2}{3} \sqrt{x^3} + \frac{2}{3} \sqrt{x} + C
 \end{aligned}$$

$$(10) \int \left(1 - \frac{x}{4} \right) dx = x - \frac{x^2}{8} + C$$

$$\begin{aligned}
 (11) \int \frac{-1}{2x} dx &= -\frac{1}{2} \int \frac{1}{x} dx \\
 &= -\frac{1}{2} \ln|x| + C
 \end{aligned}$$

$$(12) \int (7 \sin x - e^x) dx = -7 \cos x - e^x + C$$

$$(13) \int (\cos x + \pi) dx = \sin x + \pi x + C$$