Interrogation. 20 minutes.

Calculez les intégrales suivantes.

$$\int_{-3}^{-1} -\frac{1}{t^2}\ \mathrm{d}t.$$

$$\int_{0}^{1} -2t^3 + 4t^2 - 5t\ \mathrm{d}t.$$

$$\int_{1}^{4} \frac{5}{\sqrt{x}} + 3x\ \mathrm{d}x.$$

$$\int_{-1}^{1} \mathrm{e}^{x} + \mathrm{e}^{-x}\ \mathrm{d}x.$$

$$\int_{1}^{2} \frac{2t}{t^2+1}\ \mathrm{d}t.$$

$$\int_{-1}^{1} \mathrm{e}^{3t-4}\mathrm{d}t.$$

$$\int_{0}^{1} (2x+1)(x^2+x+1)\ \mathrm{d}x.$$

$$\int_{-3}^{-1} -\frac{1}{t^2}\ \mathrm{d}t = \left[\frac{1}{t}\right]_{-3}^{-1} = \frac{1}{-1} - \frac{1}{-3} = -\frac{2}{3}.$$

$$\int_0^2 -2t^3 + 4t^2 - 5t\ \mathrm{d}t = \left[-\frac{1}{2}t^4 + \frac{4}{3}t^3 - \frac{5}{2}t^2\right]_0^1 = -\frac{1}{2}\times 1^4 + \frac{4}{3}\times 1^3 - \frac{5}{2}\times 1^2 - \left(-\frac{1}{2}\times 0^4 + \frac{4}{3}\times 0^3 - \frac{5}{2}\times 0^2\right) = -\frac{5}{3}.$$

$$\int_1^4 \frac{5}{\sqrt{x}} + 3x\ \mathrm{d}x = \left[10\sqrt{x} + \frac{3}{2}x^2\right]_1^4 = 10\sqrt{4} + \frac{3}{2}\times 4^2 - \left(10\sqrt{1} + \frac{3}{2}\times 1^2\right) = 44 - \frac{23}{2} = \frac{65}{2}.$$

$$\int_{-1}^1 \mathrm{e}^x + \mathrm{e}^{-x}\ \mathrm{d}x = \left[\mathrm{e}^x - \mathrm{e}^{-x}\right]_{-1}^1 = \mathrm{e}^1 - \mathrm{e}^{-1} - \left(\mathrm{e}^{-1} - \mathrm{e}^{-(-1)}\right) = 2\mathrm{e}^1 - 2\mathrm{e}^{-1}.$$

$$\int_1^2 \frac{2t}{t^2+1}\ \mathrm{d}t = \left[\ln(t^2+1)\right]_1^2 = \ln(2^2+1) - \ln(1^2+1) = \ln\left(\frac{5}{2}\right).$$

$$\int_{-1}^1 \mathrm{e}^{3t-4}\mathrm{d}t = \left[\frac{1}{3}\mathrm{e}^{3t-4}\right]_{-1}^1 = \frac{1}{3}\mathrm{e}^{3\times 1-4} - \frac{1}{3}\mathrm{e}^{3\times(-1)-4} = \frac{\mathrm{e}^{-1} - \mathrm{e}^{-7}}{3}.$$

$$\int_0^1 (2x+1)(x^2+x+1)\ \mathrm{d}x = \left[\frac{1}{2}(x^2+x+1)^2\right]_0^1 = \frac{1}{2}(1^2+1+1)^2 - \frac{1}{2}(0^2+0+1)^2 = 4.$$