

Exercice 1 : Polynômes simples et Trigonométrie

- ① $\int (3x + 2) dx$
- ② $\int (5 - 4x) dx$
- ③ $\int (x^2 + x + 1) dx$
- ④ $\int (2x^2 - 3x + 4) dx$
- ⑤ $\int (x^3 - 1) dx$
- ⑥ $\int (4x^3 + 6x^2) dx$
- ⑦ $\int (-x^3 + 2x^2 - x + 7) dx$
- ⑧ $\int (\frac{1}{2}x^2 + 3) dx$
- ⑨ $\int \cos(x) dx$
- ⑩ $\int (2 \sin(x) - 3 \cos(x)) dx$
- ⑪ $\int (\cos(x) + x) dx$
- ⑫ $\int (3x^2 + \sin(x)) dx$
- ⑬ $\int (ax + b) dx$
- ⑭ $\int (7x^3 - 2x + \cos(x)) dx$
- ⑮ $\int (10x^2 - 5x + 2) dx$
- ⑯ $\int (\sin(x) + \pi) dx$
- ⑰ $\int (x^3 + x^2 + x) dx$
- ⑱ $\int (6x - \cos(x)) dx$
- ⑲ $\int (4 - x^2) dx$

Exercice 2 : Puissances $ax^n + bx^m + \frac{c}{x^p} + dx^r$

- ① $\int (x^2 + x^3 + \frac{1}{x^2} + 1) dx$
- ② $\int (2x^4 - \frac{3}{x^3}) dx$
- ③ $\int (x^{1/2} + x^2) dx$
- ④ $\int (x^{3/2} - 2x^5) dx$
- ⑤ $\int (\frac{4}{x^5} + x^{-2}) dx$
- ⑥ $\int (3x^{1/3} + \frac{1}{x^4}) dx$
- ⑦ $\int (x^{2/3} + x^{1/3} + x) dx$
- ⑧ $\int (5x^{-3/2} + x^2) dx$
- ⑨ $\int (\frac{1}{x^2} + \frac{1}{x^3} + x^5) dx$
- ⑩ $\int (x^4 + 2x^{1/4}) dx$
- ⑪ $\int (\frac{2}{x^{1/2}} + x^3) dx$
- ⑫ $\int (x^{-5} + x^5 + 3) dx$
- ⑬ $\int (x^{0.5} + x^{1.5} + \frac{1}{x^4}) dx$
- ⑭ $\int (4x^3 + \frac{2}{x^6} - x^{1/3}) dx$

- ⑮ $\int (x^{-1/2} + 3x^{3/4}) dx$
- ⑯ $\int (\frac{5}{x^2} - x^{2/5}) dx$
- ⑰ $\int (x^4 - \frac{1}{x^4}) dx$
- ⑱ $\int (2x^3 + 3x^{-4}) dx$
- ⑲ $\int (\frac{1}{x^{0.2}} + x^{1.2}) dx$

Exercice 3 : Forme $\sqrt[n]{ax+b}$

- ① $\int \sqrt{x+1} dx$
- ② $\int \sqrt{2x+3} dx$
- ③ $\int \sqrt[3]{x} dx$
- ④ $\int \sqrt[3]{3x+1} dx$
- ⑤ $\int \sqrt{5-x} dx$
- ⑥ $\int \sqrt[4]{x+2} dx$
- ⑦ $\int \sqrt[5]{2x} dx$
- ⑧ $\int \sqrt{4x-2} dx$
- ⑨ $\int \sqrt[3]{1-x} dx$
- ⑩ $\int \sqrt[6]{x+10} dx$
- ⑪ $\int (x+1)^{-1/2} dx$
- ⑫ $\int \sqrt{7x+4} dx$
- ⑬ $\int \sqrt[3]{5x-2} dx$
- ⑭ $\int \sqrt{\frac{1}{2}x+1} dx$
- ⑮ $\int \sqrt[4]{8x+3} dx$
- ⑯ $\int \sqrt[5]{x-1} dx$
- ⑰ $\int \sqrt[3]{2-3x} dx$
- ⑱ $\int \sqrt[3]{x} dx$
- ⑲ $\int \sqrt{ax+b} dx$

Exercice 4 : Forme $(ax+b)^n$

- ① $\int (x+1)^2 dx$
- ② $\int (x-3)^3 dx$
- ③ $\int (2x+1)^4 dx$
- ④ $\int (3x-2)^5 dx$
- ⑤ $\int (5x+4)^2 dx$
- ⑥ $\int (1-x)^6 dx$
- ⑦ $\int (2-3x)^3 dx$
- ⑧ $\int (\frac{1}{2}x+1)^4 dx$
- ⑨ $\int (4x-7)^2 dx$
- ⑩ $\int (x+10)^{10} dx$

- ⑪ $\int (2x+3)^{-2} dx$
- ⑫ $\int (5-2x)^4 dx$
- ⑬ $\int (3x+1)^{1/2} dx$
- ⑭ $\int (\frac{x}{3}-2)^3 dx$
- ⑮ $\int (10x-5)^5 dx$
- ⑯ $\int (4-x)^7 dx$
- ⑰ $\int (6x+2)^3 dx$
- ⑱ $\int (ax+b)^n dx$
- ⑲ $\int (2x+1)^{-3} dx$

Exercice 5 : Fractions du type $\frac{1}{ax+b}$

- ① $\int \frac{1}{x+1} dx$
- ② $\int \frac{1}{2x+3} dx$
- ③ $\int \frac{1}{x-5} dx$
- ④ $\int \frac{5}{x+4} dx$
- ⑤ $\int \frac{1}{3-x} dx$
- ⑥ $\int \frac{1}{4x} dx$
- ⑦ $\int \frac{2}{3x+1} dx$
- ⑧ $\int \frac{-1}{x+2} dx$
- ⑨ $\int \frac{10}{2x+5} dx$
- ⑩ $\int \frac{1}{x-1} dx$
- ⑪ $\int \frac{1}{10-x} dx$
- ⑫ $\int \frac{3}{4x-1} dx$
- ⑬ $\int \frac{1}{0.5x+2} dx$
- ⑭ $\int \frac{4}{2-3x} dx$
- ⑮ $\int \frac{1}{ax+b} dx$
- ⑯ $\int \frac{1}{\pi x+1} dx$
- ⑰ $\int \frac{1}{7x+3} dx$
- ⑱ $\int \frac{-5}{1-x} dx$
- ⑲ $\int (\frac{1}{x} + \frac{1}{x+1}) dx$

Exercice 6 : Fonctions Exponentielles e^{ax+b}

- ① $\int e^x dx$
- ② $\int e^{2x} dx$
- ③ $\int e^{3x+1} dx$
- ④ $\int e^{-x} dx$

- ⑤ $\int 5e^{5x} dx$
- ⑥ $\int e^{x/2} dx$
- ⑦ $\int e^{-3x+2} dx$
- ⑧ $\int (e^x + x) dx$
- ⑨ $\int \frac{1}{e^x} dx$
- ⑩ $\int 4e^{-2x} dx$
- ⑪ $\int (e^{2x} + e^{-2x}) dx$
- ⑫ $\int 3e^{x/3} dx$
- ⑬ $\int e^{1-x} dx$
- ⑭ $\int (e^x + 1)^2 dx$
- ⑮ $\int e^{ax+b} dx$
- ⑯ $\int \frac{e^x + e^{-x}}{2} dx$
- ⑰ $\int e^{x+10} dx$
- ⑱ $\int e^{-0.1x} dx$
- ⑲ $\int (e^x - e^{-x}) dx$

Exercice 7 : Formes composées $u'u^n$ et $\frac{u'}{u}$

- ① $\int 2x(x^2+1)^3 dx$
- ② $\int x\sqrt{x^2+1} dx$
- ③ $\int \frac{2x}{x^2+1} dx$
- ④ $\int 3x^2(x^3-1)^4 dx$
- ⑤ $\int \frac{x}{x^2+4} dx$
- ⑥ $\int \sin(x)e^{\cos(x)} dx$
- ⑦ $\int \frac{1}{x \ln(x)} dx$
- ⑧ $\int \frac{e^x}{\sqrt{e^x+2}} dx$
- ⑨ $\int (x+1)(x^2+2x)^3 dx$
- ⑩ $\int \frac{\sin(x)}{\cos^2(x)} dx$
- ⑪ $\int \frac{e^x}{e^x+1} dx$
- ⑫ $\int \cos(x) \sin^2(x) dx$
- ⑬ $\int \frac{\cos(x)}{\sin(x)} dx$
- ⑭ $\int \frac{1}{x \ln(x)} dx$
- ⑮ $\int \frac{1}{\sqrt{x}(\sqrt{x}+1)} dx$
- ⑯ $\int \frac{x+1}{x^2+2x+3} dx$
- ⑰ $\int x^2\sqrt{x^3+1} dx$
- ⑱ $\int \frac{\ln(x)}{x} dx$
- ⑲ $\int \frac{u'(x)}{u(x)} dx$

Exercice 8 : Mélanges

$P(x) + c \cdot e^{ax+b}$ et $P(x) + \sin / \cos$

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|---|---|---|
| (1) $\int (x^2 + e^x) dx$ | (6) $\int (x^2 + \frac{1}{x^2}) dx$ | (35) $\int \cos(10x) dx$ |
| (2) $\int (3x - 2 + e^{2x+1}) dx$ | (7) $\int \frac{x}{x^2+1} dx$ | (36) $\int (1 - 3x)^{-2} dx$ |
| (3) $\int (x^3 + 5e^{-x}) dx$ | (8) $\int \sin(4x - 3) dx$ | (37) $\int \frac{1}{x \ln(x)} dx$ |
| (4) $\int (2x^2 - x + 3e^{4x}) dx$ | (9) $\int (e^x + x)^2 dx$ | (38) $\int (e^x + \sin(x) - 7) dx$ |
| (5) $\int (4 - e^{3x-2}) dx$ | (10) $\int \sqrt[3]{2x-1} dx$ | (39) $\int \sqrt{x+10} dx$ |
| (6) $\int (x + \sin(x)) dx$ | (11) $\int \frac{1}{4-x} dx$ | (40) $\int \frac{5}{2x-1} dx$ |
| (7) $\int (x^2 - 2 \cos(3x)) dx$ | (12) $\int (x\sqrt{x} + \frac{1}{\sqrt{x}}) dx$ | (41) $\int x^2(x^3 + 2)^4 dx$ |
| (8) $\int (\sin(2x + 1) + \cos(x - 4)) dx$ | (13) $\int \cos(x) e^{\sin(x)} dx$ | (42) $\int e^{1-x} + \cos(x) dx$ |
| (9) $\int (3x^2 + \sin(5x) - \cos(2x)) dx$ | (14) $\int (3x + 2)^{-4} dx$ | (43) $\int (4x - 3)^{1/2} dx$ |
| (10) $\int (x^3 + e^x + \sin(x)) dx$ | (15) $\int \frac{e^x}{e^x+5} dx$ | (44) $\int \frac{x+1}{(x^2+2x)^2} dx$ |
| (11) $\int (10x + 2e^{-2x+3} + \cos(4x)) dx$ | (16) $\int (x^2 - \sin(x) + e^{2x}) dx$ | (45) $\int \sin(x/3) dx$ |
| (12) $\int (ax + b + e^{cx+d}) dx$ | (17) $\int \sqrt[4]{x+1} dx$ | (46) $\int (x^4 + x^2 + 1) dx$ |
| (13) $\int (\frac{1}{2}x^2 - \sin(x/2)) dx$ | (18) $\int \frac{2x+3}{x^2+3x+1} dx$ | (47) $\int \frac{1}{\sqrt[3]{x}} dx$ |
| (14) $\int (e^x + \cos(x) - x^4) dx$ | (19) $\int (ax + b)^n dx$ | (48) $\int \frac{e^x}{\sqrt{e^x+1}} dx$ |
| (15) $\int (3 - 4e^{2x} + \sin(3x + 1)) dx$ | (20) $\int \frac{1}{\sqrt{2x+5}} dx$ | (49) $\int (2 - x)^6 dx$ |
| (16) $\int (x^5 - \cos(5x + 2)) dx$ | (21) $\int (x^3 - \frac{2}{x^3} + \cos(x)) dx$ | (50) $\int \cos(2x + \pi/4) dx$ |
| (17) $\int (2x + 7e^{-x} + \sin(x) - \cos(x)) dx$ | (22) $\int e^{x/2} - e^{-x/2} dx$ | (51) $\int (x + \frac{1}{x})^2 dx$ |
| (18) $\int (\pi x + e^{\pi x} + \sin(\pi)) dx$ | (23) $\int \frac{\ln(x)}{x} dx$ | (52) $\int \sqrt[3]{x} dx$ |
| (19) $\int (x^2 + bx + c + e^{ax}) dx$ | (24) $\int (5x - 2)^3 dx$ | (53) $\int \frac{3x^2}{x^3-8} dx$ |
| (20) $\int (x^n + e^x + \sin(ax + b)) dx$ | (25) $\int \sqrt{1-x} dx$ | (54) $\int e^{ax} \cdot e^b dx$ |

Exercice 9 : Synthèse Générale

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|-------------------------------|---|---|
| (1) $\int (4x^3 - 2x + 1) dx$ | (26) $\int \frac{1}{3x+7} dx$ | (55) $\int (x-1)(x+1) dx$ |
| (2) $\int \frac{3}{x+2} dx$ | (27) $\int (x^2 + 1)x dx$ | (56) $\int \frac{\sin(x)}{\cos(x)} dx$ |
| (3) $\int e^{-5x+2} dx$ | (28) $\int \sin(x) \cos^2(x) dx$ | (57) $\int (3x+1)^{2/3} dx$ |
| (4) $\int \sqrt{3x+4} dx$ | (29) $\int 4e^{4x-4} dx$ | (58) $\int e^x + e^{-x} + 2 dx$ |
| (5) $\int (2x-1)^5 dx$ | (30) $\int (x+1)^{10} dx$ | (59) $\int \frac{1}{(5x+2)^3} dx$ |
| | (31) $\int (\frac{1}{x} + e^{-x} + x) dx$ | (60) $\int (x^2 + \sin(ax+b) + \frac{1}{x}) dx$ |
| | (32) $\int \sqrt[5]{x} dx$ | |
| | (33) $\int \frac{e^{2x}}{e^{2x}+3} dx$ | |
| | (34) $\int (2x+1)(x^2+x+1)^2 dx$ | |

Exercice 10 : Calcul d'intégrales définies (Avec bornes)

Calculer la valeur de chaque intégrale suivante :

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|---------------------------------|---|--|
| (1) $\int_0^1 (x^2 - x + 1) dx$ | (8) $\int_0^1 (2x + 1)^2 dx$ | (14) $\int_1^2 (x + \frac{1}{x^2}) dx$ |
| (2) $\int_1^2 (3x + 2) dx$ | (9) $\int_1^4 \sqrt{x} dx$ | (15) $\int_0^1 (e^x + 1) dx$ |
| (3) $\int_{-1}^1 x^3 dx$ | (10) $\int_0^1 e^{3x} dx$ | (16) $\int_{-1}^0 (4x^3 - 2x) dx$ |
| (4) $\int_0^\pi \sin(x) dx$ | (11) $\int_2^3 \frac{1}{x-1} dx$ | (17) $\int_0^{\pi/3} \sin(3x) dx$ |
| (5) $\int_0^{\pi/2} \cos(x) dx$ | (12) $\int_0^1 \frac{1}{\sqrt{x+1}} dx$ | (18) $\int_1^{e^2} \frac{3}{x} dx$ |
| (6) $\int_1^e \frac{1}{x} dx$ | (13) $\int_0^{\pi/4} \cos(2x) dx$ | (19) $\int_0^4 \sqrt{2x+1} dx$ |
| (7) $\int_0^{\ln(2)} e^x dx$ | | |

(20) $\int_0^1 \frac{x}{x^2+1} dx$	(27) $\int_0^{\ln(3)} e^{-x} dx$	(34) $\int_1^2 (x^2 - e^{-x}) dx$
(21) $\int_1^2 \frac{e^x}{e^x-1} dx$	(28) $\int_0^1 (ax+b) dx$	(35) $\int_0^3 \sqrt{x+1} dx$
(22) $\int_0^2 (x-1)^3 dx$	(29) $\int_{-2}^{-1} \frac{1}{x^2} dx$	(36) $\int_1^4 (\frac{1}{\sqrt{x}} + x) dx$
(23) $\int_1^8 \sqrt[3]{x} dx$	(30) $\int_0^\pi (x + \sin(x)) dx$	(37) $\int_0^1 \frac{e^x+1}{e^x+x} dx$
(24) $\int_0^1 x(x^2+1)^2 dx$	(31) $\int_1^e \frac{\ln(x)}{x} dx$	(38) $\int_0^{\pi/2} \sin^2(x) \cos(x) dx$
(25) $\int_{\pi/6}^{\pi/2} \cos(x) \sin(x) dx$	(32) $\int_0^1 \frac{1}{(x+1)^3} dx$	(39) $\int_1^2 \frac{2x+1}{x^2+x} dx$
(26) $\int_1^2 \frac{1}{3x+2} dx$	(33) $\int_0^{\pi/4} \frac{\sin(x)}{\cos^2(x)} dx$	(40) $\int_0^1 (1-x)^{10} dx$

Exercice 11 : Vérification de primitives et calcul d'intégrales

Pour chaque question :

- (1) Montrer que la fonction F est une primitive de f sur l'intervalle donné (en vérifiant que $F'(x) = f(x)$).
- (2) En déduire la valeur de l'intégrale $I = \int_a^b f(x) dx$.
- (1) $F(x) = x \ln(x) - x$; $f(x) = \ln(x)$ sur $]0; +\infty[$. Calculer $\int_1^e \ln(x) dx$.
- (2) $F(x) = \frac{1}{2}e^{x^2}$; $f(x) = xe^{x^2}$. Calculer $\int_0^1 xe^{x^2} dx$.
- (3) $F(x) = \ln(x^2+1)$; $f(x) = \frac{2x}{x^2+1}$. Calculer $\int_0^2 \frac{2x}{x^2+1} dx$.
- (4) $F(x) = (x-1)e^x$; $f(x) = xe^x$. Calculer $\int_0^1 xe^x dx$.
- (5) $F(x) = -\frac{1}{x}$; $f(x) = \frac{1}{x^2}$ sur $]0; +\infty[$. Calculer $\int_1^2 \frac{1}{x^2} dx$.
- (6) $F(x) = \sin(x) - x \cos(x)$; $f(x) = x \sin(x)$. Calculer $\int_0^\pi x \sin(x) dx$.
- (7) $F(x) = \ln(\ln(x))$; $f(x) = \frac{1}{x \ln(x)}$ sur $]1; +\infty[$. Calculer $\int_e^{e^2} \frac{1}{x \ln(x)} dx$.
- (8) $F(x) = \frac{1}{3}(x^2+1)^{3/2}$; $f(x) = x\sqrt{x^2+1}$. Calculer $\int_0^{\sqrt{3}} x\sqrt{x^2+1} dx$.
- (9) $F(x) = -\cos(e^x)$; $f(x) = e^x \sin(e^x)$. Calculer $\int_0^{\ln(\pi)} e^x \sin(e^x) dx$.
- (10) $F(x) = \frac{x}{2} - \frac{\sin(2x)}{4}$; $f(x) = \sin^2(x)$. Calculer $\int_0^{\pi/2} \sin^2(x) dx$.
- (11) $F(x) = \frac{\ln(x)^2}{2}$; $f(x) = \frac{\ln(x)}{x}$. Calculer $\int_1^e \frac{\ln(x)}{x} dx$.
- (12) $F(x) = \arctan(x)$; $f(x) = \frac{1}{1+x^2}$. Calculer $\int_0^1 \frac{1}{1+x^2} dx$.
- (13) $F(x) = (x^2-2x+2)e^x$; $f(x) = x^2e^x$. Calculer $\int_0^1 x^2e^x dx$.
- (14) $F(x) = \frac{1}{a} \ln|ax+b|$; $f(x) = \frac{1}{ax+b}$. Calculer $\int_0^1 \frac{1}{2x+1} dx$.
- (15) $F(x) = \sqrt{x^2+9}$; $f(x) = \frac{x}{\sqrt{x^2+9}}$. Calculer $\int_0^4 \frac{x}{\sqrt{x^2+9}} dx$.
- (16) $F(x) = \frac{2}{3}(x-2)\sqrt{x+1}$; $f(x) = \frac{x}{\sqrt{x+1}}$. Calculer $\int_0^3 \frac{x}{\sqrt{x+1}} dx$.
- (17) $F(x) = e^x(\sin x - \cos x)\frac{1}{2}$; $f(x) = e^x \sin x$. Calculer $\int_0^{\pi/2} e^x \sin x dx$.
- (18) $F(x) = \ln|\sin x|$; $f(x) = \cotan(x)$. Calculer $\int_{\pi/4}^{\pi/2} \frac{\cos x}{\sin x} dx$.
- (19) $F(x) = -\frac{1}{\ln x}$; $f(x) = \frac{1}{x(\ln x)^2}$. Calculer $\int_e^{e^2} \frac{1}{x(\ln x)^2} dx$.
- (20) $F(x) = \frac{(x+1)^n}{n}$; $f(x) = (x+1)^{n-1}$. Calculer $\int_0^1 (x+1)^3 dx$.
- (21) $F(x) = x \ln(x) - x$; $f(x) = \ln(x)$ sur $]0; +\infty[$. Calculer $\int_1^e \ln(x) dx$.
- (22) $F(x) = \frac{1}{2}e^{x^2}$; $f(x) = xe^{x^2}$. Calculer $\int_0^1 xe^{x^2} dx$.
- (23) $F(x) = \ln(x^2+1)$; $f(x) = \frac{2x}{x^2+1}$. Calculer $\int_0^2 \frac{2x}{x^2+1} dx$.
- (24) $F(x) = (x-1)e^x$; $f(x) = xe^x$. Calculer $\int_0^1 xe^x dx$.
- (25) $F(x) = -\frac{1}{x}$; $f(x) = \frac{1}{x^2}$ sur $]0; +\infty[$. Calculer $\int_1^2 \frac{1}{x^2} dx$.

- (26) $F(x) = \sin(x) - x \cos(x)$; $f(x) = x \sin(x)$. Calculer $\int_0^\pi x \sin(x) dx$.
- (27) $F(x) = \ln(\ln(x))$; $f(x) = \frac{1}{x \ln(x)}$ sur $]1; +\infty[$. Calculer $\int_e^{e^2} \frac{1}{x \ln(x)} dx$.
- (28) $F(x) = \frac{1}{3}(x^2 + 1)^{3/2}$; $f(x) = x\sqrt{x^2 + 1}$. Calculer $\int_0^{\sqrt{3}} x\sqrt{x^2 + 1} dx$.
- (29) $F(x) = -\cos(e^x)$; $f(x) = e^x \sin(e^x)$. Calculer $\int_0^{\ln(\pi)} e^x \sin(e^x) dx$.
- (30) $F(x) = \frac{x}{2} - \frac{\sin(2x)}{4}$; $f(x) = \sin^2(x)$. Calculer $\int_0^{\pi/2} \sin^2(x) dx$.
- (31) $F(x) = \frac{\ln(x)^2}{2}$; $f(x) = \frac{\ln(x)}{x}$. Calculer $\int_1^e \frac{\ln(x)}{x} dx$.
- (32) $F(x) = \arctan(x)$; $f(x) = \frac{1}{1+x^2}$. Calculer $\int_0^1 \frac{1}{1+x^2} dx$.
- (33) $F(x) = (x^2 - 2x + 2)e^x$; $f(x) = x^2 e^x$. Calculer $\int_0^1 x^2 e^x dx$.
- (34) $F(x) = \frac{1}{a} \ln|ax + b|$; $f(x) = \frac{1}{ax+b}$. Calculer $\int_0^1 \frac{1}{2x+1} dx$.
- (35) $F(x) = \sqrt{x^2 + 9}$; $f(x) = \frac{x}{\sqrt{x^2+9}}$. Calculer $\int_0^4 \frac{x}{\sqrt{x^2+9}} dx$.
- (36) $F(x) = \frac{2}{3}(x-2)\sqrt{x+1}$; $f(x) = \frac{x}{\sqrt{x+1}}$. Calculer $\int_0^3 \frac{x}{\sqrt{x+1}} dx$.
- (37) $F(x) = e^x(\sin x - \cos x)\frac{1}{2}$; $f(x) = e^x \sin x$. Calculer $\int_0^{\pi/2} e^x \sin x dx$.
- (38) $F(x) = \ln|\sin x|$; $f(x) = \frac{\cos(x)}{\sin(x)}$. Calculer $\int_{\pi/4}^{\pi/2} \frac{\cos x}{\sin x} dx$.
- (39) $F(x) = -\frac{1}{\ln x}$; $f(x) = \frac{1}{x(\ln x)^2}$. Calculer $\int_e^{e^2} \frac{1}{x(\ln x)^2} dx$.
- (40) $F(x) = \frac{(x+3)^n}{n}$; $f(x) = (x+3)^{n-1}$. Calculer $\int_0^1 (x+3)^5 dx$.
- (41) $F(x) = \frac{1}{2} \ln(2x^2 + 3)$; $f(x) = \frac{2x}{2x^2+3}$. Calculer $\int_0^1 \frac{2x}{2x^2+3} dx$.
- (42) $F(x) = (x^2 - 2) \sin(x) + 2x \cos(x)$; $f(x) = x^2 \cos(x)$. Calculer $\int_0^{\pi/2} x^2 \cos(x) dx$.
- (43) $F(x) = \ln(x + e^x)$; $f(x) = \frac{1+e^x}{x+e^x}$. Calculer $\int_1^2 \frac{1+e^x}{x+e^x} dx$.
- (44) $F(x) = -\frac{1}{2} \cos(x^2)$; $f(x) = x \sin(x^2)$. Calculer $\int_0^{\sqrt{\pi}} x \sin(x^2) dx$.
- (45) $F(x) = \frac{x-1}{x+1}$; $f(x) = \frac{2}{(x+1)^2}$. Calculer $\int_0^1 \frac{2}{(x+1)^2} dx$.
- (46) $F(x) = \frac{2}{3}(x+1)\sqrt{x+1}$; $f(x) = \sqrt{x+1}$. Calculer $\int_0^3 \sqrt{x+1} dx$.
- (47) $F(x) = e^x \ln(x) + \int \frac{e^x}{x} dx$ (Astuce) ; $f(x) = e^x(\ln x + \frac{1}{x})$. Calculer $\int_1^e e^x(\ln x + \frac{1}{x}) dx$.
- (48) $F(x) = \frac{1}{2}(\ln(x+1))^2$; $f(x) = \frac{\ln(x+1)}{x+1}$. Calculer $\int_0^{e-1} \frac{\ln(x+1)}{x+1} dx$.
- (49) $F(x) = \frac{\sin^4(x)}{4}$; $f(x) = \cos(x) \sin^3(x)$. Calculer $\int_0^{\pi/2} \cos(x) \sin^3(x) dx$.
- (50) $F(x) = x - 2\sqrt{x}$; $f(x) = 1 - \frac{1}{\sqrt{x}}$. Calculer $\int_1^4 (1 - \frac{1}{\sqrt{x}}) dx$.
- (51) $F(x) = \frac{e^{2x}}{2} + e^x + x$; $f(x) = (e^x + 1)^2$. Calculer $\int_0^1 (e^x + 1)^2 dx$.
- (52) $F(x) = \ln|\cos x|$; $f(x) = -\tan(x)$. Calculer $\int_0^{\pi/3} \tan(x) dx$.
- (53) $F(x) = \frac{-1}{x^2+x+1}$; $f(x) = \frac{2x+1}{(x^2+x+1)^2}$. Calculer $\int_0^1 \frac{2x+1}{(x^2+x+1)^2} dx$.
- (54) $F(x) = \frac{1}{2}e^{2x-1}$; $f(x) = e^{2x-1}$. Calculer $\int_{1/2}^1 e^{2x-1} dx$.
- (55) $F(x) = (x-2)\sqrt{2x+1} \cdot \frac{1}{3}$ (approx) ; $f(x) = \frac{x}{\sqrt{2x+1}}$. Calculer $\int_0^4 \frac{x}{\sqrt{2x+1}} dx$.
- (56) $F(x) = \sin(\ln x)$; $f(x) = \frac{\cos(\ln x)}{x}$. Calculer $\int_1^{e^{\pi/2}} \frac{\cos(\ln x)}{x} dx$.
- (57) $F(x) = \frac{1}{n+1} \ln(x^{n+1} + 1)$; $f(x) = \frac{x^n}{x^{n+1}+1}$. Calculer $\int_0^1 \frac{x^2}{x^3+1} dx$.
- (58) $F(x) = \ln(x^2 + 4)$; $f(x) = \frac{2x}{x^2+4}$. Calculer $\int_0^2 \frac{2x}{x^2+4} dx$.
- (59) $F(x) = \frac{1}{2}x^2 - \frac{1}{x}$; $f(x) = x + \frac{1}{x^2}$. Calculer $\int_1^2 (x + \frac{1}{x^2}) dx$.
- (60) $F(x) = e^x(x-1)$; $f(x) = xe^x$. Calculer $\int_{-1}^1 xe^x dx$.
- (61) $F(x) = \ln|x^2 - 1|$; $f(x) = \frac{2x}{x^2-1}$. Calculer $\int_2^3 \frac{2x}{x^2-1} dx$.

- (62) $F(x) = \frac{2}{3}(x-2)\sqrt{x+1}$; $f(x) = \frac{x}{\sqrt{x+1}}$. Calculer $\int_3^8 \frac{x}{\sqrt{x+1}} dx$.
- (63) $F(x) = \frac{-1}{\sin x}$; $f(x) = \frac{\cos x}{\sin^2 x}$. Calculer $\int_{\pi/4}^{\pi/2} \frac{\cos x}{\sin^2 x} dx$.
- (64) $F(x) = \frac{1}{2} \ln(1+e^{2x})$; $f(x) = \frac{e^{2x}}{1+e^{2x}}$. Calculer $\int_0^1 \frac{e^{2x}}{1+e^{2x}} dx$.
- (65) $F(x) = \frac{x^3}{3} \ln x - \frac{x^3}{9}$; $f(x) = x^2 \ln x$. Calculer $\int_1^e x^2 \ln x dx$.
- (66) $F(x) = \sqrt{e^x+1}$; $f(x) = \frac{e^x}{2\sqrt{e^x+1}}$. Calculer $\int_0^{\ln 3} \frac{e^x}{2\sqrt{e^x+1}} dx$.
- (67) $F(x) = \frac{1}{2}(\sin x + \cos x)e^x$; $f(x) = e^x \cos x$. Calculer $\int_0^{\pi/2} e^x \cos x dx$.
- (68) $F(x) = \ln|x + \sqrt{x^2+1}|$; $f(x) = \frac{1}{\sqrt{x^2+1}}$. Calculer $\int_0^1 \frac{1}{\sqrt{x^2+1}} dx$.
- (69) $F(x) = \frac{-1}{x \ln x}$ (Faux) $\rightarrow F(x) = \ln|\ln x|$; $f(x) = \frac{1}{x \ln x}$. Calculer $\int_e^{e^2} \frac{1}{x \ln x} dx$.
- (70) $F(x) = \frac{(ax+b)^{n+1}}{a(n+1)}$; $f(x) = (ax+b)^n$. Calculer $\int_0^1 (3x+1)^2 dx$.
- (71) $F(x) = x \arcsin x + \sqrt{1-x^2}$; $f(x) = \arcsin x$. Calculer $\int_0^1 \arcsin x dx$.
- (72) $F(x) = \ln|x^2-5x+6|$; $f(x) = \frac{2x-5}{x^2-5x+6}$. Calculer $\int_4^5 \frac{2x-5}{x^2-5x+6} dx$.
- (73) $F(x) = \frac{1}{2} \tan^2 x$; $f(x) = \frac{\tan x}{\cos^2 x}$. Calculer $\int_0^{\pi/4} \frac{\tan x}{\cos^2 x} dx$.
- (74) $F(x) = \frac{-1}{e^x+1}$; $f(x) = \frac{e^x}{(e^x+1)^2}$. Calculer $\int_0^1 \frac{e^x}{(e^x+1)^2} dx$.
- (75) $F(x) = \frac{x}{2} + \frac{\sin(2x)}{4}$; $f(x) = \cos^2 x$. Calculer $\int_0^\pi \cos^2 x dx$.
- (76) $F(x) = (x^2+1)e^x$; $f(x) = (x+1)^2 e^x$. Calculer $\int_0^1 (x+1)^2 e^x dx$.
- (77) $F(x) = \frac{2}{3}(x-b/a)\sqrt{ax+b} \cdot \frac{1}{a}$ (forme); $f(x) = \frac{x}{\sqrt{ax+b}}$. Calculer $\int_1^2 \frac{x}{\sqrt{x+1}} dx$.
- (78) $F(x) = \ln|1+\tan x|$; $f(x) = \frac{1+\tan^2 x}{1+\tan x}$. Calculer $\int_0^{\pi/4} \frac{1+\tan^2 x}{1+\tan x} dx$.
- (79) $F(x) = \frac{1}{2} \ln^2(x^2+1)$; $f(x) = \frac{2x \ln(x^2+1)}{x^2+1}$. Calculer $\int_0^1 \frac{2x \ln(x^2+1)}{x^2+1} dx$.
- (80) $F(x) = \ln|\sin x + \cos x|$; $f(x) = \frac{\cos x - \sin x}{\sin x + \cos x}$. Calculer $\int_0^{\pi/4} \frac{\cos x - \sin x}{\sin x + \cos x} dx$.

Exercice 12 : Interprétation graphique et calcul d'aires

Dans chaque cas, on considère une fonction f continue sur un intervalle $[a; b]$. On note $\mathcal{A}$ l'aire de la surface délimitée par la courbe de f , l'axe des abscisses et les droites d'équations $x = a$ et $x = b$. Calculer la mesure de cette surface hachurée (en unités d'aire).

- | | |
|--|--|
| (1) $f_1(x) = e^{-x}$ entre $x = 0$ et $x = 1$. | (11) $f_{11}(x) = (x-1)^2$ entre $x = 1$ et $x = 3$. |
| (2) $f_2(x) = \frac{1}{x}$ entre $x = 1$ et $x = e$. | (12) $f_{12}(x) = \ln(x)$ entre $x = 1$ et $x = e$ (utiliser la primitive $x \ln x - x$). |
| (3) $f_3(x) = x^2$ entre $x = 0$ et $x = 2$. | (13) $f_{13}(x) = \frac{1}{x+1}$ entre $x = 0$ et $x = 1$. |
| (4) $f_4(x) = \sin(x)$ entre $x = 0$ et $x = \pi$. | (14) $f_{14}(x) = 4 - x^2$ entre $x = 0$ et $x = 2$. |
| (5) $f_5(x) = \sqrt{x}$ entre $x = 1$ et $x = 4$. | (15) $f_{15}(x) = e^{2x}$ entre $x = 0$ et $x = \ln 2$. |
| (6) $f_6(x) = \frac{1}{x^2}$ entre $x = 1$ et $x = 3$. | (16) $f_{16}(x) = \frac{1}{\sqrt{x}}$ entre $x = 1$ et $x = 4$. |
| (7) $f_7(x) = 2x + 1$ entre $x = 0$ et $x = 2$. | (17) $f_{17}(x) = x^3$ entre $x = 0$ et $x = 1$. |
| (8) $f_8(x) = e^x$ entre $x = -1$ et $x = 1$. | (18) $f_{18}(x) = 1 + \cos(x)$ entre $x = 0$ et $x = \pi$. |
| (9) $f_9(x) = \cos(x)$ entre $x = 0$ et $x = \pi/2$. | (19) $f_{19}(x) = \frac{e^x}{e^x+1}$ entre $x = 0$ et $x = 1$. |
| (10) $f_{10}(x) = \frac{2x}{x^2+1}$ entre $x = 0$ et $x = 1$. | (20) $f_{20}(x) = \sqrt{2x+1}$ entre $x = 0$ et $x = 4$. |

Exercice 12 - Série B : Aires et Représentations Graphiques

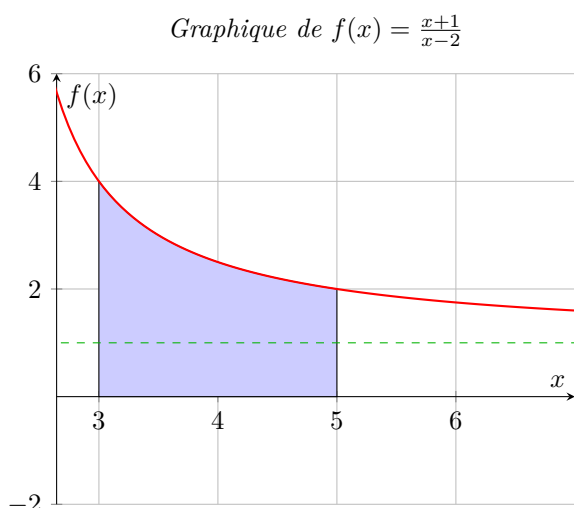
Pour chaque cas, esquisser la courbe représentative de la fonction, hachurer la surface délimitée par la courbe, l'axe des abscisses et les droites verticales données, puis calculer l'aire.

- | | |
|--|--|
| ① $f_{21}(x) = 1 + x^2$ entre $x = -1$ et $x = 1$. | ⑫ $f_{32}(x) = \cos^2(x) \sin(x)$ entre $x = 0$ et $x = \pi/2$. |
| ② $f_{22}(x) = \frac{1}{x+2}$ entre $x = 0$ et $x = 2$. | ⑬ $f_{33}(x) = \frac{e^x}{e^x+2}$ entre $x = 0$ et $x = \ln 2$. |
| ③ $f_{23}(x) = e^{x/2}$ entre $x = 0$ et $x = 2$. | ⑭ $f_{34}(x) = 5 - x$ entre $x = 1$ et $x = 4$. |
| ④ $f_{24}(x) = 2 \sin(x)$ entre $x = 0$ et $x = \pi/2$. | ⑮ $f_{35}(x) = \frac{1}{x}$ entre $x = e$ et $x = e^2$. |
| ⑤ $f_{25}(x) = \frac{1}{\sqrt{2x+4}}$ entre $x = 0$ et $x = 6$. | ⑯ $f_{36}(x) = \sin(2x)$ entre $x = 0$ et $x = \pi/4$. |
| ⑥ $f_{26}(x) = x^2 - 2x + 1$ entre $x = 0$ et $x = 2$. | ⑰ $f_{37}(x) = (x+1)^3$ entre $x = 0$ et $x = 1$. |
| ⑦ $f_{27}(x) = \frac{1}{x^2+1}$ entre $x = 0$ et $x = 1$. | ⑱ $f_{38}(x) = \frac{x}{\sqrt{x^2+1}}$ entre $x = 0$ et $x = \sqrt{3}$. |
| ⑧ $f_{28}(x) = 3x^2$ entre $x = -1$ et $x = 0$. | ⑲ $f_{39}(x) = 2 - e^{-x}$ entre $x = 0$ et $x = 2$. |
| ⑨ $f_{29}(x) = \ln(x+1)$ entre $x = 0$ et $x = e - 1$. | ⑳ $f_{40}(x) = \pi \sin(\pi x)$ entre $x = 0$ et $x = 1$. |
| ⑩ $f_{30}(x) = e^{-2x}$ entre $x = 0$ et $x = 1$. | |
| ⑪ $f_{31}(x) = \sqrt[3]{x}$ entre $x = 1$ et $x = 8$. | |

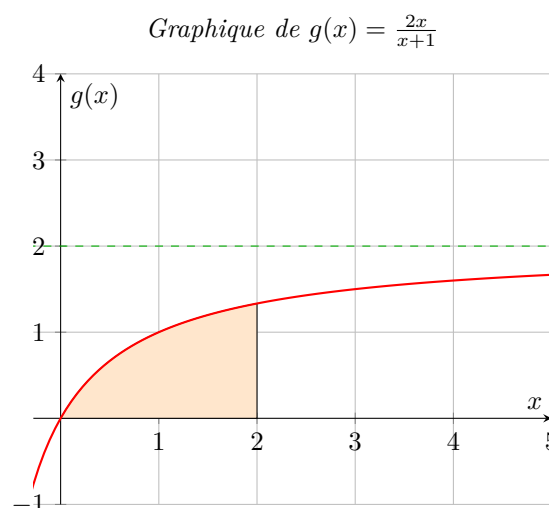
Exercice 13 : Calcul d'aires à partir de graphiques

Pour chaque graphique ci-dessous, la fonction est de la forme $f(x) = \frac{ax+b}{cx+d}$. Déterminez l'expression de la fonction à partir du graphique (ou utilisez celle donnée), puis calculez l'aire de la surface hachurée entre les bornes indiquées.

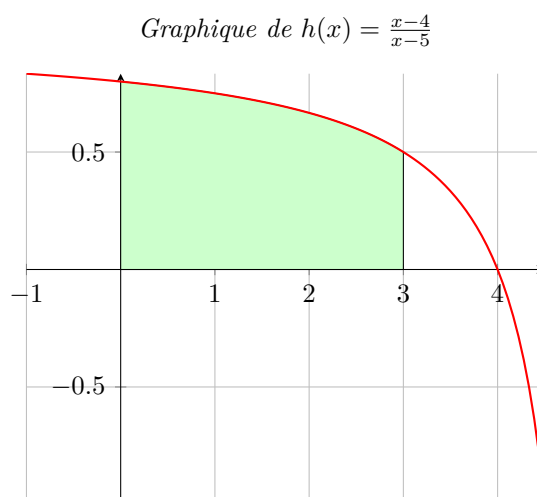
1) Aire sous $f(x) = \frac{x+1}{x-2}$ entre $x = 3$ et $x = 5$



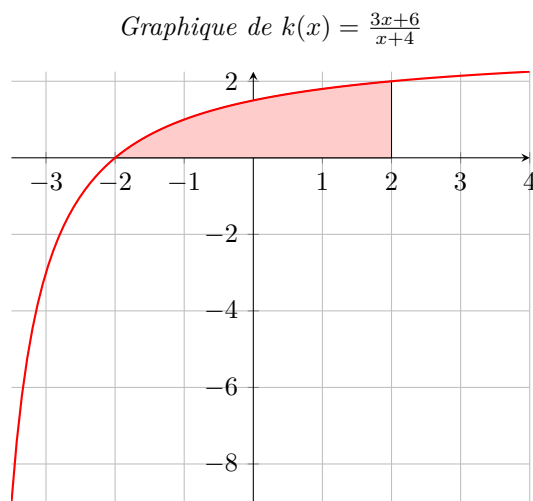
2) Aire sous $f(x) = \frac{2x}{x+1}$ entre $x = 0$ et $x = 2$



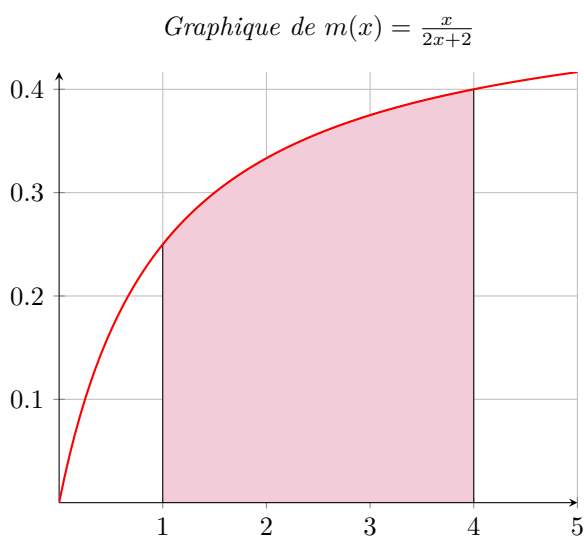
3) Aire sous $h(x) = \frac{x-4}{x-5}$ entre $x = 0$ et $x = 3$



4) Aire sous $k(x) = \frac{3x+6}{x+4}$ entre $x = -2$ et $x = 2$



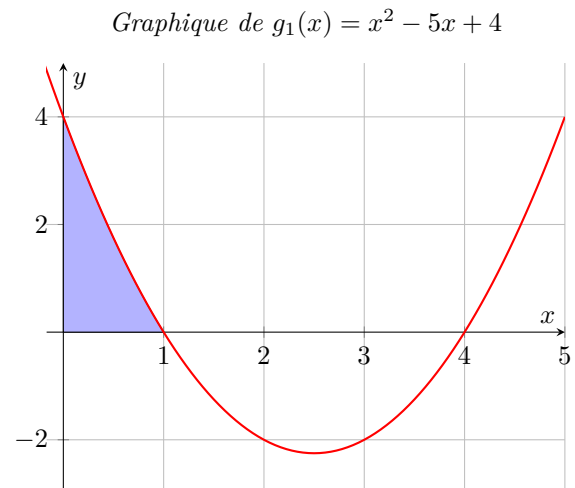
5) Aire sous $m(x) = \frac{x}{2x+2}$ entre $x = 1$ et $x = 4$



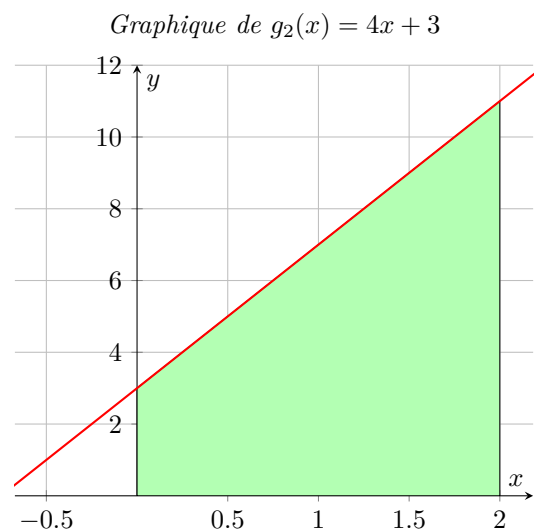
Exercice 14 : Aires sous courbes variées

Pour chaque graphique, calculez l'aire de la surface colorée délimitée par la courbe, l'axe des abscisses et les bornes indiquées.

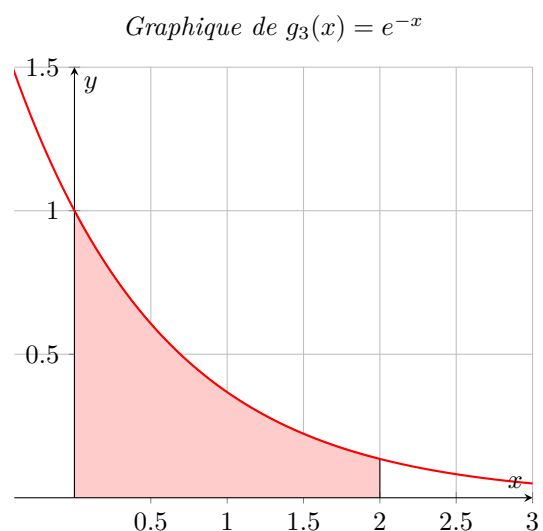
6) Aire sous $g_1(x) = x^2 - 5x + 4$ entre $x = 0$ et $x = 1$



7) Aire sous $g_2(x) = 4x + 3$ entre $x = 0$ et $x = 2$

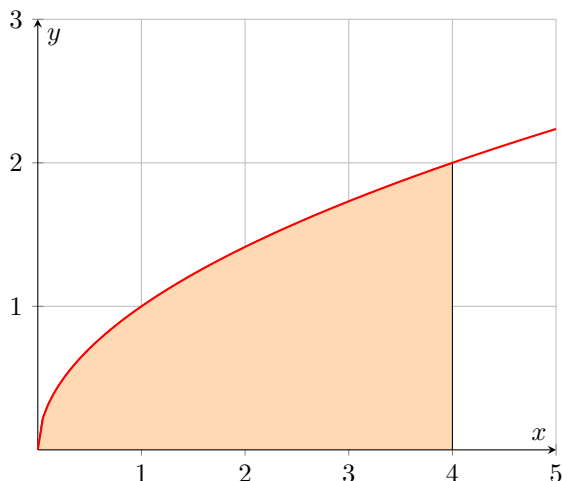


8) Aire sous $g_3(x) = e^{-x}$ entre $x = 0$ et $x = 2$



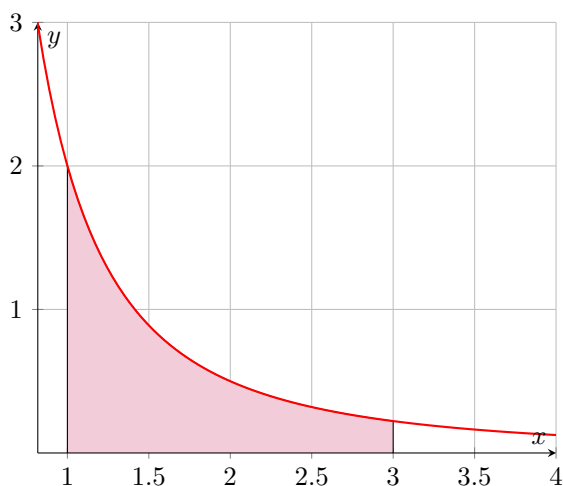
9) Aire sous $g_4(x) = \sqrt{x}$ entre $x = 0$ et $x = 4$

Graphique de $g_4(x) = \sqrt{x}$



10) Aire sous $g_5(x) = \frac{2}{x^2}$ entre $x = 1$ et $x = 3$

Graphique de $g_5(x) = \frac{2}{x^2}$



11) Aire sous $g_6(x) = \sin(x)$ entre $x = 0$ et $x = \pi$

Graphique de $g_6(x) = \sin(x)$

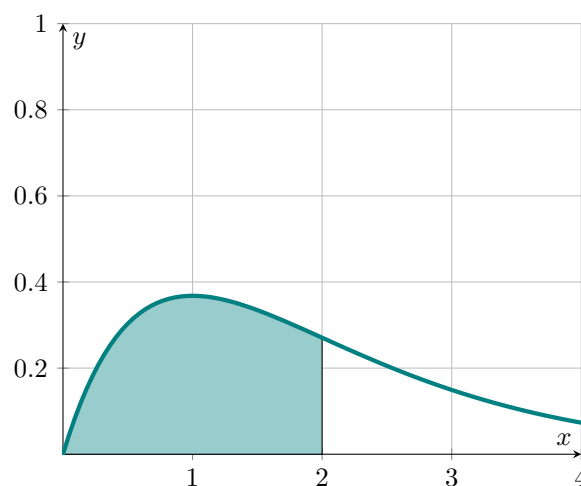


Exercice 15 : Variété de Courbes

Calculez l'aire de la surface hachurée pour chaque cas ci-dessous en utilisant les outils du calcul intégral.

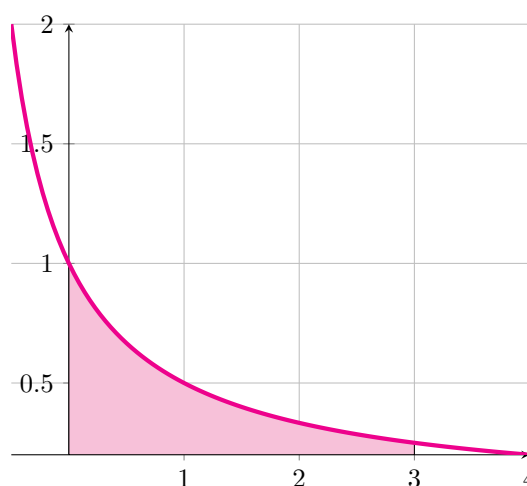
12) Aire sous $g_{12}(x) = xe^{-x}$ entre $x = 0$ et $x = 2$

Graphique de $g_{12}(x) = xe^{-x}$

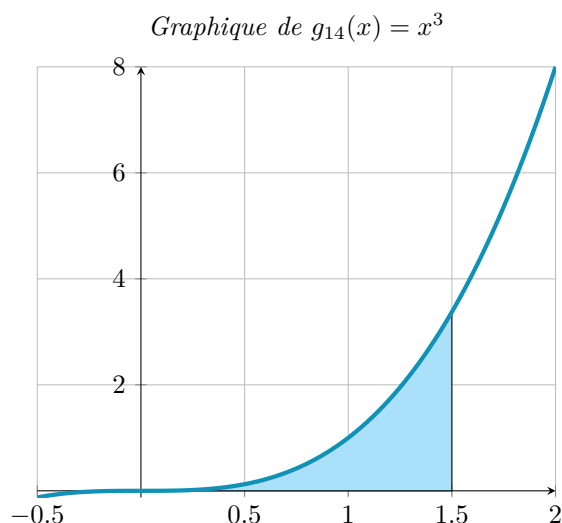


13) Aire sous $g_{13}(x) = \frac{1}{x+1}$ entre $x = 0$ et $x = 3$

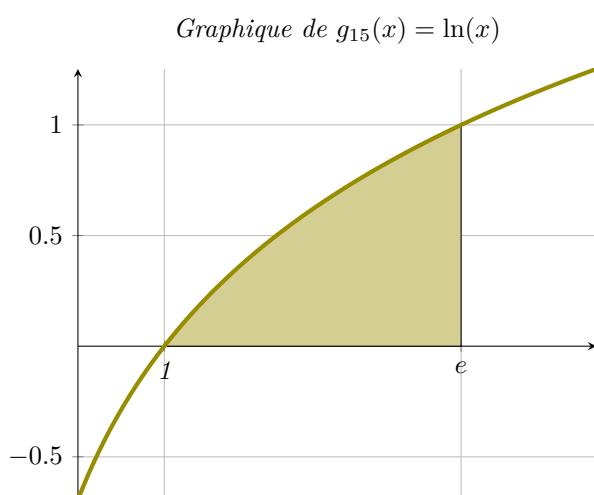
Graphique de $g_{13}(x) = \frac{1}{x+1}$



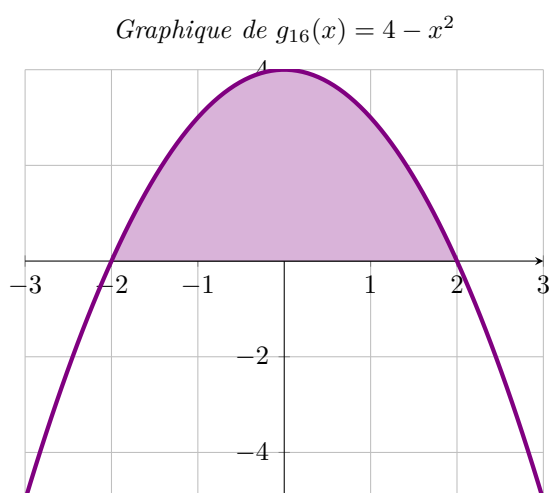
14) Aire sous $g_{14}(x) = x^3$ entre $x = 0$ et $x = 1.5$



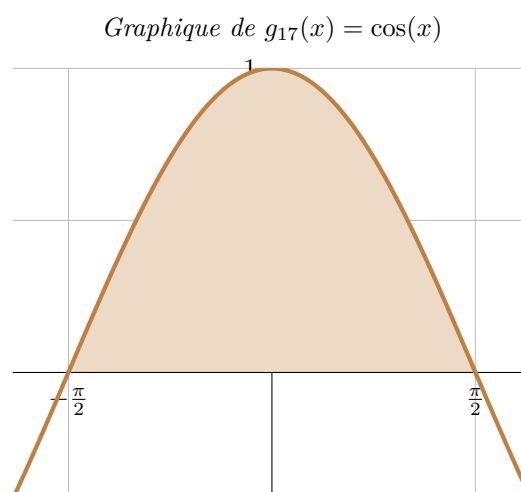
15) Aire sous $g_{15}(x) = \ln(x)$ entre $x = 1$ et $x = e$



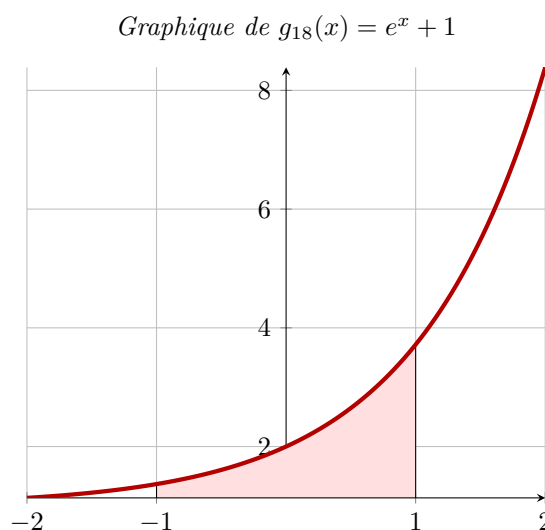
16) Aire sous $g_{16}(x) = 4 - x^2$ entre $x = -2$ et $x = 2$



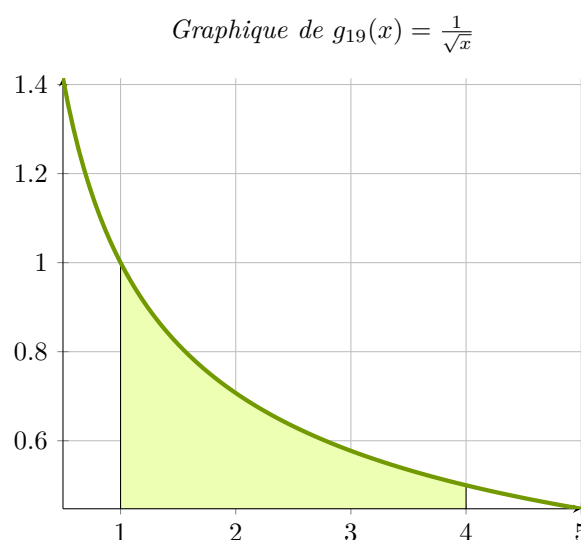
17) Aire sous $g_{17}(x) = \cos(x)$ entre $x = -\pi/2$ et $x = \pi/2$



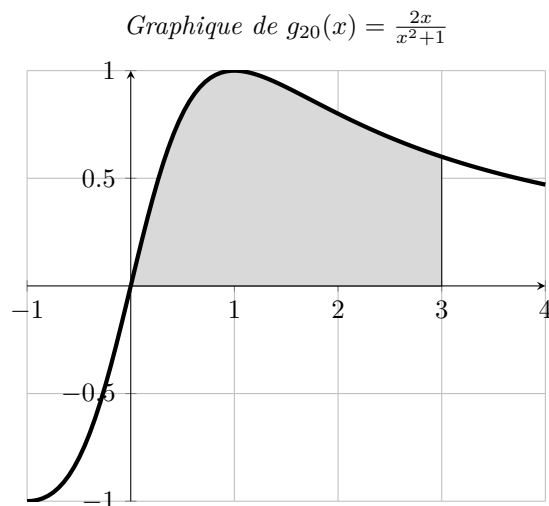
18) Aire sous $g_{18}(x) = e^x + 1$ entre $x = -1$ et $x = 1$



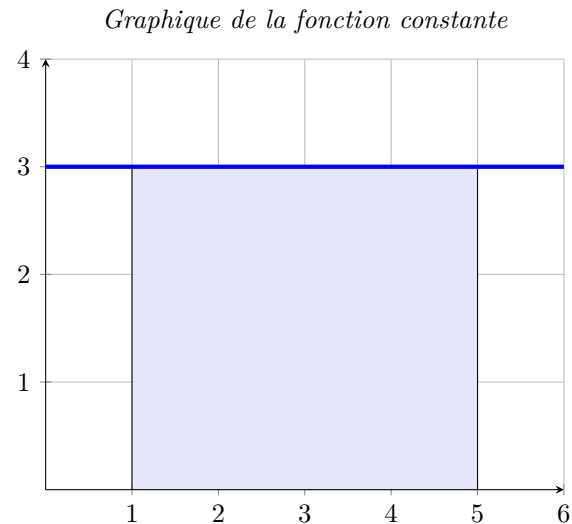
19) Aire sous $g_{19}(x) = \frac{1}{\sqrt{x}}$ entre $x = 1$ et $x = 4$



20) Aire sous $g_{20}(x) = \frac{2x}{x^2+1}$ entre $x = 0$ et $x = 3$



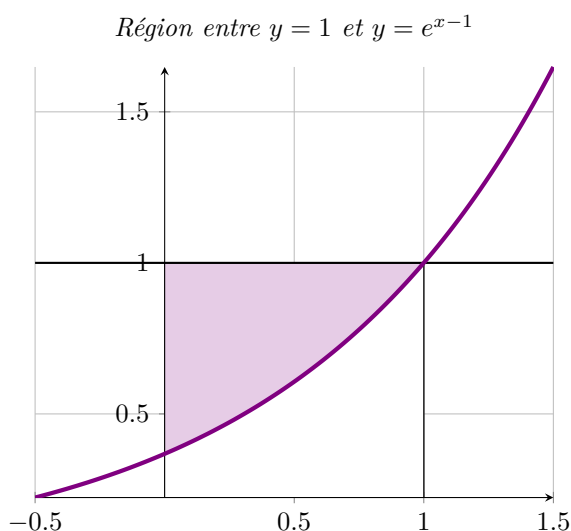
21) Aire sous la fonction constante $g_{21}(x) = 3$ entre $x = 1$ et $x = 5$



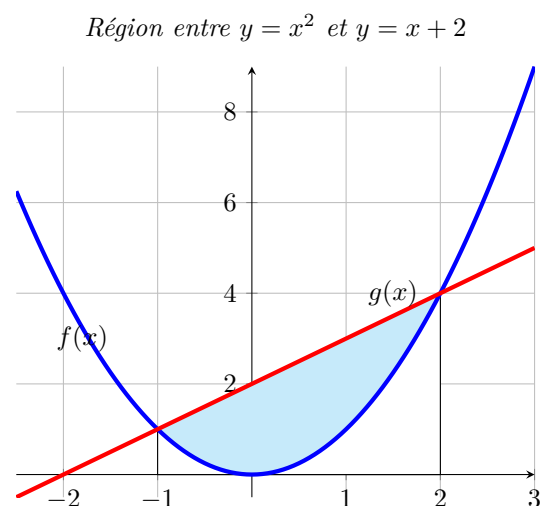
Exercice 16 : Aire comprise entre deux courbes

Pour chaque cas, identifiez la fonction dominante (celle du dessus), déterminez les points d'intersection si nécessaire, et calculez l'aire de la surface comprise entre les deux courbes.

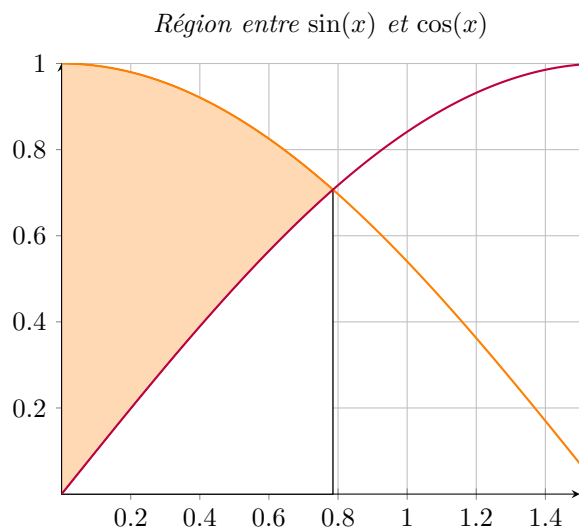
1) Entre $f(x) = e^{x-1}$ et $g(x) = 1$ sur $[0; 1]$



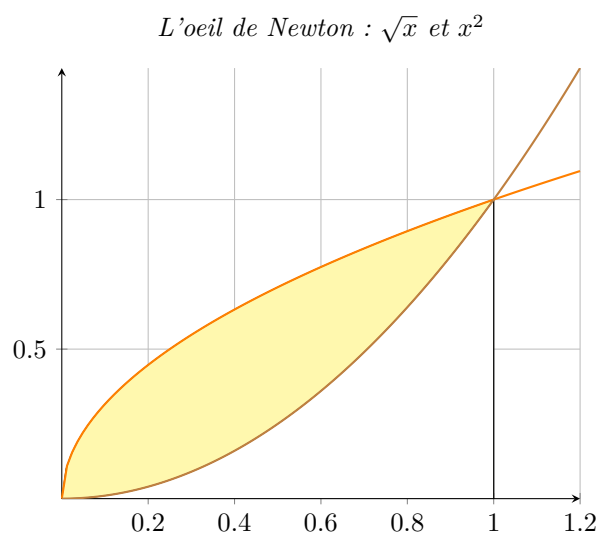
1) Entre $f(x) = x^2$ et $g(x) = x + 2$



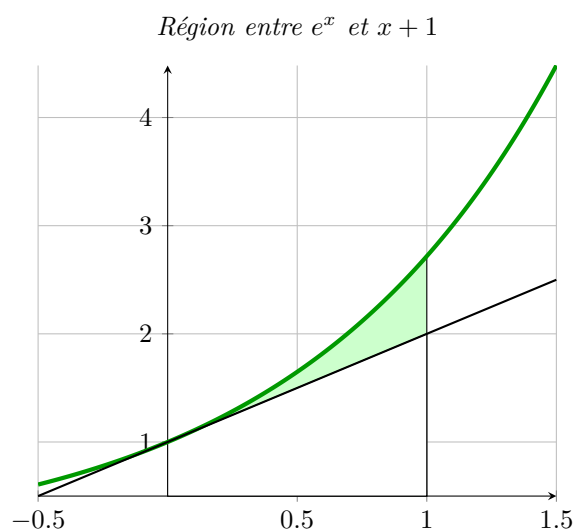
2) Entre $f(x) = \sin(x)$ et $g(x) = \cos(x)$ sur $[0; \pi/4]$



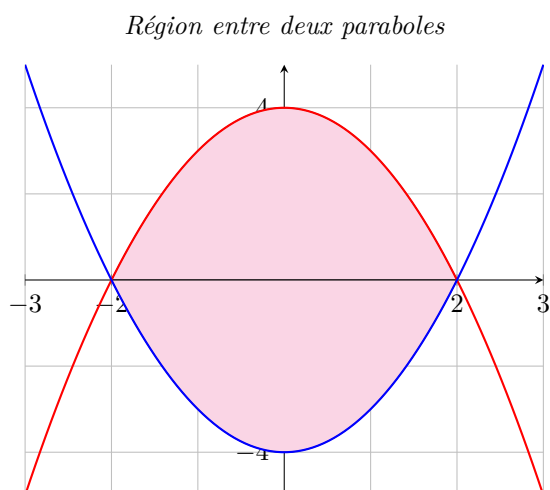
5) Entre $f(x) = \sqrt{x}$ et $g(x) = x^2$ sur $[0; 1]$



3) Entre $f(x) = e^x$ et $g(x) = x + 1$ sur $[0; 1]$



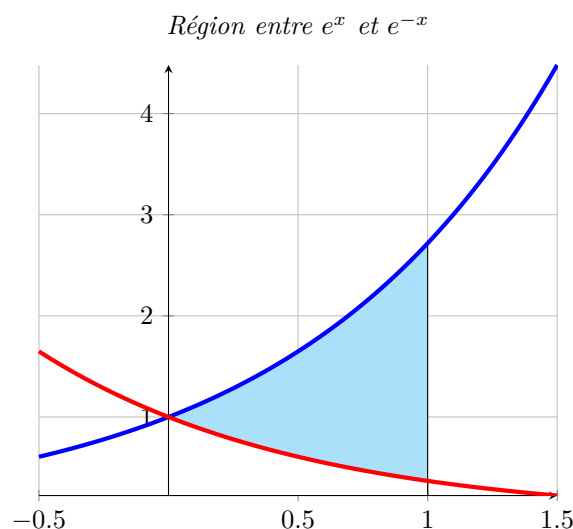
4) Entre $f(x) = 4 - x^2$ et $g(x) = x^2 - 4$



Exercice 17 - Série B : Aires entre courbes (Exponentielles et Logarithmes)

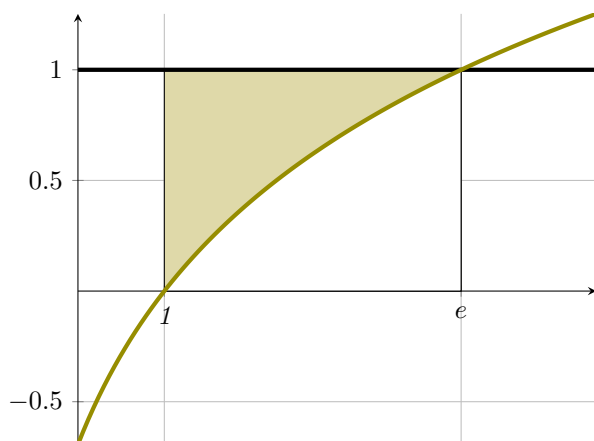
Déterminez l'aire de la surface comprise entre les deux courbes données sur l'intervalle indiqué.

6) Entre $f(x) = e^x$ et $g(x) = e^{-x}$ sur $[0; 1]$



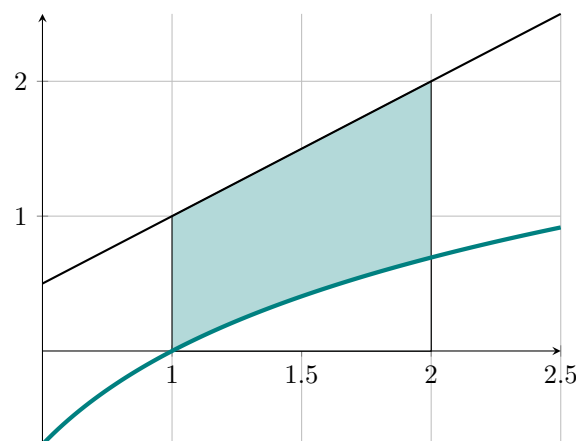
7) Entre $f(x) = \ln(x)$ et $g(x) = 1$ sur $[1; e]$

Région entre $y = 1$ et $y = \ln(x)$



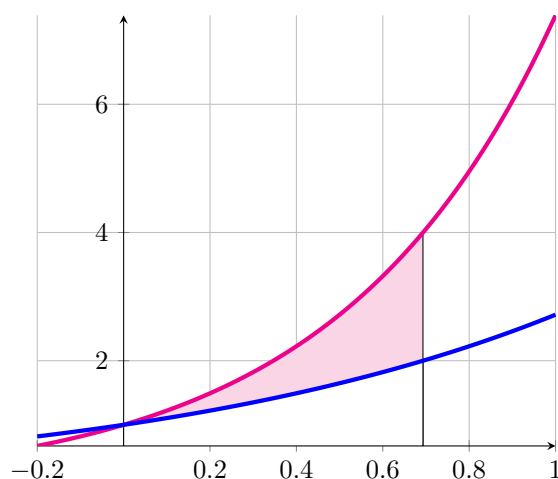
9) Entre $f(x) = x$ et $g(x) = \ln(x)$ sur $[1; 2]$

Région entre $y = x$ et $y = \ln(x)$



8) Entre $f(x) = e^{2x}$ et $g(x) = e^x$ sur $[0; \ln 2]$

Région entre e^{2x} et e^x



Exercice 18 : Intégration par parties (IPP)

Calculer les intégrales suivantes en utilisant la méthode d'intégration par parties :

Série A : Polynômes et Trigonométrie (20 exercices)

- | | | |
|--|---|--|
| ① $\int_0^\pi x \sin(x) dx$ | ⑧ $\int_0^\pi x^2 \cos(x) dx$ | ⑮ $\int_0^{\pi/2} x^2 \sin(2x) dx$ |
| ② $\int_0^{\pi/2} x \cos(x) dx$ | ⑨ $\int_0^{\pi/2} x \sin(x + \pi/4) dx$ | ⑯ $\int_{-\pi}^\pi x \cos(x) dx$ |
| ③ $\int_0^\pi (2x + 1) \sin(x) dx$ | ⑩ $\int_0^\pi (x^2 + x) \sin(x) dx$ | ⑰ $\int_0^{2\pi} x \sin(x) dx$ |
| ④ $\int_0^{\pi/2} (3x - 2) \cos(x) dx$ | ⑪ $\int_0^{\pi/2} 2x \cos(3x) dx$ | ⑱ $\int_0^{\pi/2} (4x + 3) \cos(x) dx$ |
| ⑤ $\int_0^\pi x \sin(2x) dx$ | ⑫ $\int_0^\pi (1 - x) \sin(x) dx$ | ⑲ $\int_0^\pi x \sin(x/2) dx$ |
| ⑥ $\int_0^{\pi/4} x \cos(2x) dx$ | ⑬ $\int_0^{\pi/3} x \sec^2(x) dx$ | ⑳ $\int_0^\pi (x^2 - 1) \cos(x) dx$ |
| ⑦ $\int_0^\pi x^2 \sin(x) dx$ (double IPP) | ⑭ $\int_0^\pi (x - 1) \cos(2x) dx$ | |

Série B : Polynômes et Exponentielles (20 exercices)

- | | | |
|-----------------------------|----------------------------------|--------------------------------------|
| ① $\int_0^1 x e^x dx$ | ④ $\int_0^{\ln 2} x e^{2x} dx$ | ⑦ $\int_0^1 x^2 e^x dx$ (double IPP) |
| ② $\int_0^1 x e^{-x} dx$ | ⑤ $\int_{-1}^1 (x + 1) e^x dx$ | ⑧ $\int_0^1 (x^2 - 2x) e^x dx$ |
| ③ $\int_0^1 (2x) e^{-x} dx$ | ⑥ $\int_0^2 (3x - 1) e^{x/2} dx$ | ⑨ $\int_0^3 x e^{-x} dx$ |

$\textcircled{10} \int_0^1 (4x+2)e^{2x} dx$	$\textcircled{14} \int_0^{\ln 3} 2xe^x dx$	$\textcircled{18} \int_0^2 (x-1)e^{-2x} dx$
$\textcircled{11} \int_{-1}^0 xe^{-x} dx$	$\textcircled{15} \int_0^1 (1-x)e^x dx$	$\textcircled{19} \int_1^2 xe^x dx$
$\textcircled{12} \int_0^1 x^2e^{-x} dx$	$\textcircled{16} \int_0^1 x^3e^x dx$	$\textcircled{20} \int_0^1 (x^2+1)e^{-x} dx$
$\textcircled{13} \int_0^2 (x+3)e^x dx$	$\textcircled{17} \int_0^1 xe^{3x+1} dx$	

Série C : Fonctions Logarithmes (20 exercices)

$\textcircled{1} \int_1^e \ln(x) dx$	$\textcircled{8} \int_e^{e^2} \ln(x) dx$	$\textcircled{15} \int_1^e \ln(2x) dx$
$\textcircled{2} \int_1^e 3\ln(x) dx$	$\textcircled{9} \int_1^e (x+1)\ln(x) dx$	$\textcircled{16} \int_1^e \frac{\ln(x)}{\sqrt{x}} dx$
$\textcircled{3} \int_1^e x\ln(x) dx$	$\textcircled{10} \int_1^e \frac{1}{x^2} \ln(x) dx$	$\textcircled{17} \int_1^e x^n \ln(x) dx$
$\textcircled{4} \int_1^2 x^2 \ln(x) dx$	$\textcircled{11} \int_1^4 \ln(\sqrt{x}) dx$	$\textcircled{18} \int_1^2 \ln(x^2) dx$
$\textcircled{5} \int_1^e \frac{\ln(x)}{x^2} dx$	$\textcircled{12} \int_2^e \ln(x-1) dx$	$\textcircled{19} \int_e^{2e} \ln(x/e) dx$
$\textcircled{6} \int_1^e \sqrt{x} \ln(x) dx$	$\textcircled{13} \int_1^e x^3 \ln(x) dx$	$\textcircled{20} \int_1^e (x^2+x+1)\ln(x) dx$
$\textcircled{7} \int_1^e (\ln x)^2 dx$	$\textcircled{14} \int_1^2 (2x-1)\ln(x) dx$	

Exercice 19 : Pratique intensive de l'IPP

Calculer les intégrales suivantes en posant judicieusement $u(x)$ et $v'(x)$.

Série D : Variations Trigonométriques

$\textcircled{1} \int_0^\pi x \sin(3x) dx$	$\textcircled{8} \int_0^\pi e^x \sin(x) dx$	$\textcircled{15} \int_{-\pi}^\pi (x+1) \cos(x) dx$
$\textcircled{2} \int_0^{\pi/2} 2x \cos(4x) dx$	$\textcircled{9} \int_0^1 x \arctan(x) dx$	$\textcircled{16} \int_0^{\pi/4} \frac{x}{\cos^2(x)} dx$
$\textcircled{3} \int_0^\pi (x+2) \sin(x/2) dx$	$\textcircled{10} \int_0^{\pi/2} x^2 \cos(2x) dx$	$\textcircled{17} \int_0^\pi e^{2x} \sin(3x) dx$
$\textcircled{4} \int_0^\pi (5-x) \cos(x) dx$	$\textcircled{11} \int_0^\pi (x^2+1) \sin(x) dx$	$\textcircled{18} \int_0^{\pi/2} (x^2-4) \sin(x) dx$
$\textcircled{5} \int_0^{\pi/4} x \sin(2x + \pi/4) dx$	$\textcircled{12} \int_0^{\pi/2} x \sin^2(x) \cos(x) dx$	$\textcircled{19} \int_0^\pi x \cos(x/3) dx$
$\textcircled{6} \int_0^{\pi/2} x^2 \sin(x) dx$	$\textcircled{13} \int_0^\pi x \cos^2(x) \sin(x) dx$	$\textcircled{20} \int_0^1 \arcsin(x) dx$
$\textcircled{7} \int_0^\pi e^x \cos(x) dx$	$\textcircled{14} \int_0^{\pi/6} x \sin(3x) dx$	

Série E : Exponentielles et Puissances (20 exercices)

$\textcircled{1} \int_0^1 x^2 e^{2x} dx$	$\textcircled{8} \int_0^1 x e^{ax+b} dx$	$\textcircled{15} \int_0^1 \frac{x}{e^x} dx$
$\textcircled{2} \int_0^2 x^2 e^{-x} dx$	$\textcircled{9} \int_1^2 (x-1)e^{2x} dx$	$\textcircled{16} \int_0^{\ln 5} x e^x dx$
$\textcircled{3} \int_0^1 (x+3)e^{-2x} dx$	$\textcircled{10} \int_0^{0.5} x e^{-4x} dx$	$\textcircled{17} \int_0^1 (x+1)^2 e^x dx$
$\textcircled{4} \int_0^{\ln 2} (2x+1)e^x dx$	$\textcircled{11} \int_0^1 x^2 e^{x/2} dx$	$\textcircled{18} \int_0^1 x^2 e^{-3x} dx$
$\textcircled{5} \int_{-2}^0 (x+2)e^x dx$	$\textcircled{12} \int_{-1}^1 x e^x dx$	$\textcircled{19} \int_1^e x e^{\ln x} dx$
$\textcircled{6} \int_0^1 x^3 e^{-x} dx$	$\textcircled{13} \int_0^1 (2x^2-1)e^{-x} dx$	$\textcircled{20} \int_0^1 (1-x^2)e^x dx$
$\textcircled{7} \int_0^1 (x^2+x+1)e^x dx$	$\textcircled{14} \int_0^2 x e^{x-2} dx$	

Série F : Logarithmes et Fonctions Composées

$\textcircled{1} \int_1^e x^4 \ln(x) dx$	$\textcircled{7} \int_1^4 \sqrt{x} \ln(\sqrt{x}) dx$	$\textcircled{12} \int_1^e \ln(x+1) dx$
$\textcircled{2} \int_1^e \frac{\ln(x)}{x^3} dx$	$\textcircled{8} \int_1^e x \ln(x^2) dx$	$\textcircled{13} \int_1^e x \ln(2x) dx$
$\textcircled{3} \int_1^2 (x^2+1) \ln(x) dx$	$\textcircled{9} \int_2^3 (x-2) \ln(x) dx$	$\textcircled{14} \int_1^2 x^n \ln(x) dx$
$\textcircled{4} \int_1^e \ln(x^2+x) dx$	$\textcircled{10} \int_1^e \frac{\ln(x)+1}{x} dx$	$\textcircled{15} \int_1^e (\ln x)^3 dx$
$\textcircled{5} \int_1^e \ln(1/x) dx$	$\textcircled{11} \int_1^e (x^2-1) \ln(x) dx$	
$\textcircled{6} \int_e^{e^2} \frac{\ln(x)}{\sqrt{x}} dx$		