

1 Intégration par décomposition

1. $\int (6 + 8x^5) dx = 6x + \frac{4x^6}{3} + C$
2. $\int \sqrt[3]{x^2} dx = \frac{3x\sqrt[3]{x^2}}{5} + C$
3. $\int \frac{1}{x^3} dx = \frac{-1}{2x^2} + C$
4. $\int \frac{x^2}{\sqrt{x}} dx = \frac{2x^2\sqrt{x}}{5} + C$
5. $\int (\sqrt{x} + \frac{1}{\sqrt{x}}) dx = \frac{2x\sqrt{x}}{3} + 2\sqrt{x} + C$
6. $\int (3x^5 + \sqrt{x}) dx = \frac{x^6}{2} + \frac{2x\sqrt{x}}{3} + C$
7. $\int \sqrt{x}(3x - 2) dx = \frac{6x^2\sqrt{x}}{5} - \frac{4x\sqrt{x}}{3} + C$
8. $\int (\frac{\sqrt[3]{x^2} + 1}{\sqrt[3]{x}}) dx = \frac{3x\sqrt[3]{x}}{4} + \frac{3\sqrt[3]{x^2}}{2} + C$
9. $\int (2 - \sqrt[3]{x^2})^3 dx = 8x - \frac{36}{5}x\sqrt[3]{x^2} + \frac{18}{7}x^2\sqrt[3]{x} - \frac{1}{3}x^3 + C$
10. $\int \frac{2x^2 + 3x + 1}{x} dx = x^2 + 3x + \ln|x| + C$
11. $\int \frac{3x^2 - 5x + 3}{2x} dx = \frac{3}{4}x^2 - \frac{5}{2}x + \frac{3}{2}\ln|x| + C$
12. $\int \frac{4x + 1}{x^2} dx = 4\ln|x| - \frac{1}{x} + C$
13. $\int \frac{1 - 3x + 2x^2}{2x^2} dx = \frac{-1}{2x} - \frac{3}{2}\ln|x| + x + C$
14. $\int \frac{1 - x}{x} dx = \ln|x| - x + C$
15. $\int \frac{x\sqrt{x} + 1}{\sqrt{x}} dx = \frac{x^2}{2} + 2\sqrt{x} + C$
16. $\int \frac{x^2 + 1}{x - 1} dx = \frac{x^2}{2} + x + 2\ln|x - 1| + C$
17. $\int \frac{x^2 + 1}{x + 1} dx = \frac{x^2}{2} - x + 2\ln|x + 1| + C$
18. $\int \frac{3x^2 - 7x + 1}{x - 2} dx = \frac{3x^2}{2} - x - \ln|x - 2| + C$
19. $\int \frac{1 - 3x + 2x^2}{2x - 3} dx = \frac{1}{2}x^2 + \frac{1}{2}\ln|2x + 3| + C$
20. $\int \frac{1 - \sin^2 x}{\cos x} dx = \sin x + C$
21. $\int \frac{\sqrt[3]{x^2} + 1}{\sqrt[3]{x}} dx = \frac{3}{4}x\sqrt[3]{x} + \frac{3}{2}\sqrt[3]{x^2} + C$

2 Intégration par substitution (série 1)

1. $\int \sqrt{-3x} dx = \frac{-2\sqrt{(-3x)^3}}{9} + C$ ($t = -3x$)
2. $\int \sqrt{9+4x} dx = \frac{\sqrt{(9+4x)^3}}{6} + C$ ($t = 9+4x$)
3. $\int (2x+1)^n dx = \frac{(2x+1)^{n+1}}{2(n+1)} + C$ ($t = 2x+1$)
4. $\int \frac{8x^2}{(x^3+2)^3} dx = \frac{-4}{3(x^3+2)^2} + C$ ($t = x^3+2$)
5. $\int \frac{6x}{(5-3x^2)^2} dx = \frac{1}{(5-3x^2)} + C$ ($t = 5-3x^2$)
6. $\int x^2 \sqrt{x^3+1} dx = \frac{2\sqrt{(x^3+1)^3}}{9} + C$ ($t = x^3+1$)
7. $\int \frac{2x+1}{\sqrt{x^2+x+1}} dx = 2\sqrt{x^2+x+1} + C$ ($t = x^2+x+1$)
8. $\int \frac{x^2}{\sqrt[4]{x^3+2}} dx = \frac{4}{9} \sqrt[4]{(x^3+2)^3} + C$ ($t = x^3+2$)
9. $\int x \sqrt[3]{1-x^2} dx = \frac{-3}{8} \sqrt[3]{(1-x^2)^4} + C$ ($t = 1-x^2$)
10. $\int x \sqrt{1-x^2} dx = \frac{-1}{3} \sqrt{(1-x^2)^3} + C$ ($t = 1-x^2$)
11. $\int \frac{4x^2}{\sqrt{x^3+8}} dx = \frac{8}{3} \sqrt{x^3+8} + C$ ($t = x^3+8$)
12. $\int \frac{(\sqrt{7}-\sqrt{x})^{13}}{\sqrt{x}} dx = \frac{-(\sqrt{7}-\sqrt{x})^{14}}{7} + C$ ($t = \sqrt{7}-\sqrt{x}$)
13. $\int \frac{x^3}{\sqrt{4+x^4}} dx = \frac{1}{2} \sqrt{4+x^4} + C$ ($t = 4+x^4$)
14. $\int x^2(x^3+2)^2 dx = \frac{1}{9}(x^3+2)^3 + C$ ($t = x^3+2$)
15. $\int \frac{x+3}{\sqrt[3]{x^2+6x}} dx = \frac{3}{4} \sqrt[3]{(x^2+6x)^2} + C$ ($t = x^2+6x$)
16. $\int \frac{x}{(x^2+1)^n} dx = \frac{1}{2(1-n)(x^2+1)^{n-1}} + C$ ($t = x^2+1$)
17. $\int \frac{x}{(x^2-1)^3} dx = \frac{-1}{4(x^2-1)^2} + C$ ($t = x^2-1$)
18. $\int \frac{x}{1+2x^2} dx = \frac{1}{4} \ln|1+2x^2| + C$ ($t = 1+2x^2$)

3 Intégration par substitution (série 2)

1. $\int (x^2 - 3x + 1)(2x - 3) dx = \frac{1}{2}(x^2 - 3x + 1)^2 + C$
2. $\int (2x^2 - 6x + 1)(2x - 3) dx = \frac{1}{4}(x^2 - 6x + 1)^2 + C$
3. $\int \frac{2x - 3}{x^2 - 3x + 1} dx = \ln |x^2 - 3x + 1| + C$
4. $\int (3x^2 - 6x + 2)(x - 1) dx = \frac{1}{12}(3x^2 - 6x + 2)^2 + C$
5. $\int (2x^2 + 4x + 2)^2(x - 1) dx = \frac{1}{12}(2x^2 + 4x + 1)^3 + C$
6. $\int \frac{2x}{x^2 - 1} dx = \ln |x^2 - 1| + C$
7. $\int \frac{2x + 1}{x^2 + x - 1} dx = \ln |x^2 + x - 1| + C$
8. $\int \frac{x - 1}{x^2 - 2x + 2} dx = \frac{1}{2} \ln |x^2 - x + 2| + C$
9. $\int \frac{x - 1}{x^2 - 2x + 2} dx = \frac{1}{2} \ln |x^2 - x + 2| + C$
10. $\int \frac{8x^2}{(x^3 + 2)^3} dx = \frac{-4}{3(x^3 + 2)^2} + C$
11. $\int \frac{6x}{(5 - 3x^2)^2} dx = \frac{1}{5 - 3x^2} + C$
12. $\int x^2 \sqrt{x^3 + 1} dx = \frac{2}{9}(x^3 + 1)\sqrt{x^3 + 1} + C$
13. $\int \frac{2x + 1}{\sqrt{x^2 + x + 1}} dx = 2\sqrt{x^2 + x + 1} + C$
14. $\int \frac{x^2}{\sqrt[4]{x^3 + 2}} dx = \frac{4}{9}(x^3 + 2)\sqrt{x^3 + 2} + C$
15. $\int x^3 \sqrt{1 - x^2} dx = \frac{-3}{8}(1 - x^2)\sqrt[3]{1 - x^2}$
16. $\int \frac{1}{9x^2 + 6x + 1} dx = \frac{-1}{3(3x + 1)} + C$

4 Intégration par substitution (série 3)

1. $\int \sin 5x \, dx = \frac{-1}{5} \cos 5x + C$ ($t = 5x$)
2. $\int \frac{\cos x}{\sin^4 x} \, dx = \frac{-1}{3 \sin^3 x} + C$ ($t = \sin x$)
3. $\int \sin 2x \cos^3 2x \, dx = \frac{-\cos^4 2x}{8} + C$ ($t = \cos 2x$)
4. $\int \frac{\cos 3x}{\sqrt{3 + \sin 3x}} \, dx = \frac{2}{3} \sqrt{3 + \sin 3x} + C$ ($t = 3 + \sin 3x$)
5. $\int \sin x \sqrt{\cos x} \, dx = \frac{-2}{3} \sqrt{\cos^3 x} + C$ ($t = \cos x$)
6. $\int \frac{1}{\cos^2 x \sqrt{1 - \tan x}} \, dx = -2\sqrt{1 - \tan x} + C$ ($t = \sqrt{1 - \tan x}$)
7. $\int \frac{\sin x}{\sqrt{4 - \cos x}} \, dx = 2\sqrt{4 - \cos x} + C$ ($\sqrt{4 - \cos x}$)
8. $\int \frac{\tan x}{\sqrt{\cos x}} \, dx = \frac{2}{\sqrt{\cos x}} + C$ ($t = \cos x$)
9. $\int \frac{\sin x}{\cos^5 x} \, dx = \frac{1}{4 \cos^4 x} + C$ ($t = \cos x$)
10. $\int \frac{e^x}{1 + e^x} \, dx = \ln |1 + e^x| + C$ ($t = 1 + e^x$)
11. $\int e^{3x} \, dx = \frac{1}{3} e^{3x} + C$ ($t = 3x$)
12. $\int \frac{1}{x \ln x} \, dx = \ln |\ln |x|| + C$ ($t = \ln x$)
13. $\int \sin^2 x \cos x \, dx = \frac{1}{3} \sin^3 x + C$ ($t = \sin x$)
14. $\int \cos^3 x \sin x \, dx = \frac{-1}{4} \cos^4 x + C$ ($t = \cos x$)
15. $\int \tan x \, dx = -\ln |\cos x| + C$ ($t = \cos x$)
16. $\int \frac{\sin x + \cos x}{\sin x} \, dx = x + \ln |\sin x| + C$ (\dots puis $t = \sin x$)

5 Intégration par parties

1. $\int x e^x dx = e^x(x - 1) + C$
2. $\int x \cos x dx = x \sin x + \cos x + C$
3. $\int e^x \cos x dx = \frac{1}{2}e^x(\sin x + \cos x) + C$
4. $\int e^x \sin x dx = \frac{1}{2}e^x(\sin x - \cos x) + C$
5. $\int e^x \cos 2x dx = \frac{1}{5}e^x(\cos 2x + 2 \sin 2x) + C$
6. $\int \ln x dx = x \ln |x| - x + C$
7. $\int \ln(1 + x) dx = (1 + x) \ln |1 + x| - x + C$
8. $\int x e^{2x} dx = e^{2x}\left(\frac{x}{2} - \frac{1}{4}\right) + C$
9. $\int x e^{-x} dx = -e^{-x}(x + 1) + C$
10. $\int x^2 e^{-x} dx = -e^{-x}(x^2 + 2x + 2) + C$
11. $\int x^2 e^{3x} dx = \frac{1}{3}e^{3x}\left(x^2 - \frac{2x}{3} + \frac{2}{9}\right) + C$
12. $\int x(x + 1)e^{2x} dx = \frac{1}{3}x^2 e^{2x} + C$
13. $\int x \ln x dx = \frac{1}{2}x^2\left(\ln x - \frac{1}{2}\right) + C$
14. $\int x^3 \ln^2 x dx = x^4\left(\frac{1}{4}\ln^2 x - \frac{1}{8}\ln x + \frac{1}{32}\right) + C$
15. $\int x^2 \ln x dx = \frac{1}{3}x^3\left(\ln x - \frac{1}{3}\right) + C$
16. $\int \frac{\ln x}{x} dx = \frac{1}{2}\ln^2 x + C$
17. $\int \ln^3 x dx = x \ln^3 x - 3x \ln^2 x + 6x \ln x - 6x + C$
18. $\int x^2 \sin x dx = 2x \sin x - (x^2 - 2) \cos x + C$
19. $\int x^2 \cos x dx = 2x \cos x + (x^2 - 2) \sin x + C$
20. $\int e^{3x} \cos 2x dx = e^{3x}\left(\frac{2}{13} \sin 2x + \frac{3}{13} \cos 2x\right) + C$
21. $\int e^x(2 \sin x - 3 \cos x) dx = \frac{-1}{2}e^x(\sin x + 5 \cos x) + C$
22. $\int x e^{-2x} dx = -e^{-2x}\left(\frac{x}{2} + \frac{1}{4}\right) + C$
23. $\int 3^x e^x dx = \frac{3^x e^x}{1 + \ln 3}$

6 Quotients de polynômes

1. $\int \frac{6x^2 - 3x}{x + 1} dx = 3x^2 - 9x + 9 \ln|x + 1| + C$
2. $\int \frac{x^2 - x + 1}{3x - 1} dx = \frac{1}{6}x^2 - \frac{2}{9}x + \frac{7}{27} \ln|3x - 1| + C$
3. $\int \frac{2x^2 - 3x + 1}{2x - 3} dx = \frac{1}{2}x^2 + \frac{1}{2} \ln|2x - 3| + C$
4. $\int \frac{x^2 + 2x + 1}{x^2 + 1} dx = x + \ln|x^2 + 1| + C$
5. $\int \frac{x^2 - 3x - 1}{x^2 - 1} dx = x - \frac{3}{2} \ln|x^2 - 1| + C$
6. $\int \frac{x^3 + x^2 - 1}{x^3 - 1} dx = x + \frac{1}{3} \ln|x^3 - 1| + C$
7. $\int \frac{2x^3 - x^2 + 2}{x^3 + 1} dx = 2x - \frac{1}{3} \ln|x^3 + 1| + C$
8. $\int \frac{x}{x + 1} dx = x - \ln|x + 1| + C$
9. $\int \frac{x^3 + 3x^2 - 9x - 3}{x - 2} dx = \frac{1}{3}x^3 + \frac{5}{2}x^2 + x - \ln|x - 2| + C$

7 De tout, un peu