

Problemas de integrales

2º de Bachillerato 2003

Comprueba el valor de las siguientes integrales resolviéndolas por sustitución:

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

16. $\int 3(x-3)^{5/2} dx = \frac{6(x-3)^{7/2}}{7} + C$
17. $\int \frac{-3}{\sqrt{2x+3}} dx = -3\sqrt{2x+3} + C$
18. $\int \frac{4x+6}{(x^2+3x+7)^3} dx = -\frac{1}{(x^2+3x+7)^2} + C$
19. $\int \frac{x+1}{(x^2+2x-3)^2} dx = -\frac{1}{2(x^2+2x-3)} + C$
20. $\int x^3 \sqrt{x^4+2} dx = \frac{(x^4+2)^{3/2}}{6} + C$
21. $\int \frac{1}{\sqrt{x}(1+\sqrt{x})^2} dx = -\frac{2}{\sqrt{x}+1} + C$
22. $\int \left(1 + \frac{1}{x}\right)^3 \left(\frac{1}{x^2}\right) dx = -\frac{4x^3 + 6x^2 + 4x + 1}{4x^4} + C$
23. $\int \frac{x^2}{(1+x^3)^2} dx = -\frac{1}{3(x^3+1)} + C$
24. $\int \frac{x^2}{\sqrt{1+x^3}} dx = \frac{2\sqrt{x^3+1}}{3} + C$
25. $\int \frac{x^3}{\sqrt{1+x^4}} dx = \frac{\sqrt{x^4+1}}{2} + C$
26. $\int \frac{x+2x^2}{\sqrt{x}} dx = \frac{2x^{3/2}(6x+5)}{15} + C$
27. $\int \frac{1}{2\sqrt{x}} dx = \sqrt{x} + C$
28. $\int \frac{1}{(3x)^2} dx = -\frac{1}{9x} + C$
29. $\int \frac{1}{\sqrt{2x}} dx = \sqrt{2x} + C$
30. $\int \frac{1}{3x^2} dx = -\frac{1}{3x} + C$
31. $\int \frac{x^2+3x+7}{\sqrt{x}} dx = \frac{2\sqrt{x}(x^2+5x+35)}{5} + C$
32. $\int \frac{x^{5/2} + 5x^{1/2}}{x^{5/2}} dx = \frac{x^2-5}{x} + C$

33. $\int x^2 \left(x - \frac{2}{x} \right) dx = \frac{x^2(x^2 - 4)}{4} + C$
34. $\int \left(\frac{x^3}{3} + \frac{1}{4x^2} \right) dx = \frac{x^4}{14} - \frac{1}{4x} + C$
35. $\int (9 - x)\sqrt{x} dx = \frac{2x^{3/2}(15 - x)}{5} + C$
36. $\int 2\pi x(8 - x^{3/2}) dx = \frac{4\pi x^2(14 - x^{3/2})}{7} + C$
37. $\int (2x - 1)^2 dx = \frac{(2x - 1)^3}{6} + C$
38. $\int x(x^2 - 1)^2 dx = \frac{(x^2 - 1)^3}{6} + C$
39. $\int x\sqrt{x - 3} dx = \frac{2(x + 2)(x - 3)^{3/2}}{5} + C$
40. $\int x\sqrt{2x + 1} dx = \frac{(2x + 1)^{3/2}(3x - 1)}{15} + C$
41. $\int x^2\sqrt{1 - x} dx = -\frac{2(1 - x)^{3/2}(15x^2 + 12x + 8)}{105} + C$
42. $\int \frac{2x - 1}{\sqrt{x + 3}} dx = \frac{2\sqrt{x + 3}(2x - 15)}{3} + C$
43. $\int \frac{x^2 - 1}{\sqrt{2x - 1}} dx = \frac{\sqrt{2x - 1}(3x^2 + 2x - 13)}{15} + C$
44. $\int x^3\sqrt{x + 2} dx = \frac{2(x + 2)^{3/2}(35x^2 - 60x^2 + 96x - 128)}{315} + C$
45. $\int \frac{-x}{(x + 1) - \sqrt{x + 1}} dx = -2\sqrt{x + 1} - x + C$
46. $\int x\sqrt[3]{x + 1} dx = \frac{3(x + 1)^{4/3}(4x - 3)}{28} + C$
47. $\int \frac{x}{\sqrt{2x + 1}} dx = \frac{(x - 1)\sqrt{2x + 1}}{3} + C$
48. $\int (x + 1)\sqrt{2 - x} dx = -\frac{2(2 - x)^{3/2}(x + 3)}{5} + C$
49. $\int \sin 2x dx = -\frac{\cos 2x}{2} + C$

50. $\int x \sin x^2 dx = -\frac{\cos x^2}{2} + C$
51. $\int x \cos x^2 dx = \frac{\sin x^2}{2} + C$
52. $\int \cos 6x dx = \frac{\sin 6x}{6} + C$
53. $\int \sec^2\left(\frac{x}{2}\right) dx = 2 \tan\left(\frac{x}{2}\right) + C$
54. $\int \csc^2\left(\frac{x}{2}\right) dx = -2 \cot\left(\frac{x}{2}\right) + C$
55. $\int \sec(1-x) \tan(1-x) dx = -\frac{1}{\cos(x-1)} + C$
56. $\int \sin 2x \cos 2x dx = -\frac{\cos 4x}{8} + C$
57. $\int \frac{\csc^2 x}{\cot^3 x} dx = \frac{\tan^2 x}{2} + C$
58. $\int \csc 2x \cot 2x dx = -\frac{1}{2 \sin 2x} + C$
59. $\int \cot^2 x dx = -(x + \cot x) + C$
60. $\int \frac{\sin x}{\cos^2 x} dx = \frac{1}{\cos x} + C$
61. $\int \tan^4 x \sec^2 x dx = \frac{\tan^5 x}{5} + C$
62. $\int \sqrt{\cot x} \csc^2 x dx = -\frac{2(\cot x)^{3/2}}{3} + C$