Table of integration formulas (p. 506). Constants of integration have been omitted.

1. $\int x^n \, dx = \frac{x^{n+1}}{n+1} \quad (n \neq -1)$

2. $\int \frac{1}{x} \, dx = \ln |x|$

3. $\int e^x \, dx = e^x$

4. $\int a^x \, dx = \frac{a^x}{\ln a}$

5. $\int \sin x \, dx = - \cos x$

6. $\int \cos x \, dx = - \sin x$

7. $\int \sec^2 x \, dx = \tan x$

8. $\int \csc^2 x \, dx = - \cot x$

9. $\int \sec x \tan x \, dx = \sec x$

10. $\int \csc x \cot x \, dx = - \csc x$

etc.

(There are 20 integrals in the table, altogether.)

(1) $$\int \frac{2t}{(t-3)^2}\, dt$$

(2) $$\int \frac{e^{\arctan y}}{1+y^2}\, dy$$

(3) $$\int \frac{x}{x^4 + x^2 + 1}\, dx$$

(4) $$\int \sin^3(\theta) \cos^5(\theta)\, d\theta$$

(5) $$\int \frac{dx}{(1-x^2)^{3/2}}$$

(6) $$\int_0^{1/2} \frac{x}{\sqrt{1-x^2}}\, dx$$

(7) $$\int_0^{1/\sqrt{2}} \frac{x^2}{\sqrt{1-x^2}}\, dx$$

(8) $$\int \frac{e^{2t}}{1+e^{4t}}\, dt$$

(9) $$\int e^{3\sqrt{x}}\,dx$$

(10) $$\int t^3 e^{-2t}\,dt$$

(11) $$\int x\sin^{-1}x\,dx$$

(12) $$\int_0^4 \frac{x-1}{x^2-4x-5}\,dx$$

(13) $$\int \frac{dx}{x\sqrt{4x+1}}$$

from old midterms:

(14) $$\int \sin^3 x \tan^2 x \cos^2 x\,dx$$

(15) $$\int_1^2 \frac{dx}{x^2(x+1)}$$

(16) $$\int \frac{dx}{\sqrt{4x^2 + 8x - 12}}$$

(17) $$\int \frac{x^3}{\sqrt{9 - x^2}}\, dx$$

(18) $$\int x \tan^{-1} x\, dx$$

(19) $$\int \frac{x^3 + 2}{x^2 - 1}\, dx$$

(20) $$\int_0^1 \frac{x^3}{x^2 + 1}\, dx$$

(21) $$\int \frac{1}{x^2\sqrt{x^2 - 1}}\, dx$$

(22) $$\int \frac{4}{x^2(x + 2)}\, dx$$

(23) $$\int \frac{\cos x}{4 - \sin^2 x}\, dx$$

(24) $$\int \frac{x^3}{\sqrt{4 - x^2}}\, dx$$

(25) $$\int_0^1 (x^2 + 1)e^{-x}\, dx$$

(26) $$\int_1^4 \frac{e^{1/x}}{x^2}\, dx$$

(27) $$\int \frac{2x + 3}{x^2 - 2x + 1}\, dx$$

(28) $$\int_0^{\pi/4} \cos^6(3x)\sec^3(3x)\, dx$$

(29) $$\int_{1/2}^1 \frac{\sqrt{1 - x^2}}{x}\, dx$$

(30) $$\int_2^{\sqrt{8}} \frac{dx}{x^4\sqrt{x^2 - 4}}$$

(31) $$\int \frac{e^{3x}}{e^{2x-1}}\, dx$$

(32) $$\int x \ln x \, dx$$

(33) $$\int \sin^2 y \cos^2 y \, dy$$

(34) $$\int \frac{\sin \theta}{\sqrt{2 - \cos^2 \theta}} \, d\theta$$

(35) $$\int \cos 3\theta \, d\theta$$

(36) $$\int_1^2 \frac{x^3}{x^2 + x + \frac{1}{2}} \, dx$$

(37) $$\int \frac{\sqrt{y - 4}}{y} \, dy$$