

3 Métodos de Integración

48. Calcular las siguientes integrales:

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|---|--|---|
| (a) $\int_3^5 \frac{3}{\sqrt{x}} - \frac{x\sqrt{x}}{4} dx$ | (j) $\int_1^2 \frac{\ln(x)}{x} dx$ | (s) $\int_0^\pi x \operatorname{sen}(x^2) dx$ |
| (b) $\int_1^2 \frac{1}{\sqrt[4]{x}} dx$ | (k) $\int_{\frac{\pi}{2}}^{\frac{3\pi}{4}} \frac{\cos(x)}{\operatorname{sen}(x)} dx$ | (t) $\int_0^1 \sec(1-x) \operatorname{tg}(1-x) dx$ |
| (c) $\int_2^6 (x^2 + \frac{1}{\sqrt[3]{x}})^2 dx$ | (l) $\int_0^1 \frac{\operatorname{sen}(2x)}{1 + \cos(2x)^2} dx$ | (u) $\int_{-2}^2 \frac{6x}{(1+x^2)^3} dx$ |
| (d) $\int_4^9 1 + \frac{1}{x^2} + \frac{4}{x\sqrt{x}} dx$ | (m) $\int_1^4 \sqrt{3x-1} dx$ | (v) $\int_{-3}^0 u^3 \cdot \sqrt{u^4+2} du$ |
| (e) $\int_1^4 \frac{x+1}{\sqrt{x}} dx$ | (n) $\int_{-2}^3 (e^x + 1)^2 dx$ | (w) $\int_2^4 (1 + \frac{1}{t})^3 \cdot \frac{1}{t^2} dt$ |
| (f) $\int_0^{\frac{\pi}{4}} \frac{\operatorname{sen}(x)}{\cos^2(x)} dx$ | (o) $\int_4^9 \frac{(\sqrt{x}+1)^2}{\sqrt{x}} dx$ | (x) $\int_3^8 \frac{x^3}{\sqrt[4]{1+x^4}} dx$ |
| (g) $\int_3^9 \frac{x^2+x+1}{\sqrt[3]{x}} dx$ | (p) $\int_{-2}^4 x^2 e^{x^3} dx$ | (y) $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{\cos(x)}{\operatorname{sen}^4(x)} dx$ |
| (h) $\int_0^{\frac{\pi}{4}} (t^2 + \sec^2(t)) dt$ | (q) $\int_1^4 \frac{e^{2x}}{e^{2x}+3} dx$ | (z) $\int_{\frac{\pi}{5}}^{\frac{\pi}{4}} \operatorname{tg}^4(x) \cdot \sec^2(x) dx$ |
| (i) $\int_0^{\frac{\pi}{4}} \operatorname{tg}^2(y) + 1 dx$ | (r) $\int_{-1}^{-1} \frac{dx}{e^{3x}+4}$ | |

49. Calcular

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| (a) $\int x e^x dx$ | (i) $\int x^2 \operatorname{sen}(x) dx$ | (q) $\int \frac{x}{\sqrt{2+3x}} dx$ |
| (b) $\int \ln(x) dx$ | (j) $\int u \ln(u+1) du$ | (r) $\int \frac{x^3 e^{x^2}}{(x^2+1)^2} dx$ |
| (c) $\int x \operatorname{sen}(x) dx$ | (k) $\int \frac{x}{e^x} dx$ | (s) $\int \frac{3x^2}{x^2+1} dx$ |
| (d) $\int x^n \ln(x) dx$ | (l) $\int \sec(x) dx$ | (t) $\int \frac{1}{x^2-x} dx$ |
| (e) $\int x \cos^2(x) dx$ | (m) $\int 4u \sec(u) \operatorname{tg}(u) dt$ | (u) $\int \frac{e^x}{e^{2x}-e^x} dx$ |
| (f) $\int \sec^3(x) dx$ | (n) $\int e^{2x} \operatorname{sen}(x) dx$ | (v) $\int \frac{1}{\sqrt{16-x^2}} dx$ |
| (g) $\int e^x \cos(2x) dx$ | (o) $\int \frac{\ln(2u)}{u^2} du$ | (w) $\int \frac{1}{x^2+10x+16} dx$ |
| (h) $\int \frac{x e^x}{(x+1)^2} dx$ | (p) $\int 1 + \frac{t e^{2t}}{(2t+1)^2} dt$ | (x) $\int \tan^3(x) dx$ |

50. Calcular las siguientes integrales de expresiones trigonométricas:

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| (a) $\int \operatorname{sen}^5(x) \cos(x) dx$ | (c) $\int \operatorname{sen}^3(x) \cos^4(x) dx$ | (e) $\int \operatorname{sen}^2(x) \cos^5(x) dx$ |
| (b) $\int \sec^4(x) \operatorname{tg}(x) dx$ | (d) $\int \sec^4(2x) dx$ | (f) $\int \operatorname{tg}^3(1-u) du$ |

(g) $\int \cos^3\left(\frac{x}{2}\right) dx$	(l) $\int \frac{1}{\sec(x) \operatorname{tg}(x)} dx$	(q) $\int \cos^7(x) dx$
(h) $\int \operatorname{tg}^5\left(\frac{x}{4}\right) dx$	(m) $\int \operatorname{sen}^2(\pi x) \cos^4(\pi x) dx$	(r) $\int \operatorname{tg}^4(t) - \sec^4(t) dt$
(i) $\int \frac{\operatorname{sen}^3(4x)}{\sqrt{\cos(4x)}} dx$	(n) $\int \sec^2(3x) \operatorname{tg}^2(3x) dx$	(s) $\int \cos^3(x) \sqrt{\operatorname{sen}^5(x)} dx$
(j) $\int \sec^2\left(\frac{\pi x}{2}\right) \operatorname{tg}^3\left(\frac{\pi x}{2}\right) dx$	(o) $\int \frac{\operatorname{sen}^2(x) - \cos^2(x)}{\cos(x)} dx$	(t) $\int \operatorname{cosec}^4(x) dx$
(k) $\int \frac{\cos^3(x)}{\operatorname{sen}^4(x)} dx$	(p) $\int \sec^2(u) \sqrt{\operatorname{tg}(u)} du$	

51. Calcular las siguientes integrales utilizando sustitución trigonométrica:

(a) $\int \frac{dx}{x^2 \sqrt{9-x^2}}$	(h) $\int \frac{x^3}{\sqrt{x^2-4}} dx$	(o) $\int \frac{x^2}{(4+x^2)^2} dx$
(b) $\int \frac{\sqrt{x^2-3}}{x} dx$	(i) $\int \frac{x^2}{\sqrt{2x-x^2}} dx$	(p) $\int \frac{1}{(1+x^2)^3} dx$
(c) $\int \frac{dx}{\sqrt{(25-x^2)^3}}$	(j) $\int \frac{1}{4+4x^2+x^4} dx$	(q) $\int \frac{x^3+x+1}{x^4+2x^2+1} dx$
(d) $\int \frac{x}{\sqrt{x^2+9}} dx$	(k) $\int \sqrt{1+x^2} dx$	(r) $\int \frac{1}{x^2-5x+6} dx$
(e) $\int \sqrt{16-4x^2} dx$	(l) $\int (x+1) \sqrt{x^2+2x+2} dx$	(s) $\int \frac{\sqrt{4x^2+9}}{x^4} dx$
(f) $\int \frac{1}{\sqrt{4x^2+16}} dx$	(m) $\int e^x \sqrt{1-e^{2x}} dx$	(t) $\int \frac{1}{(x^2+1)^2} dx$
(g) $\int \frac{\sqrt{x^2-4}}{x} dx$	(n) $\int e^{2x} \sqrt{1+e^{2x}} dx$	

52. Calcule las siguientes integrales utilizando descomposición en fracciones parciales:

(a) $\int \frac{1}{x^2-5x+6} dx$	(g) $\int \frac{x^2+12x+12}{x^3-4x} dx$	(l) $\int \frac{x^2+x+3}{x^4+6x^2+9} dx$
(b) $\int \frac{5x^2+20x+6}{x^3+2x+x} dx$	(h) $\int \frac{x^3-x+3}{x^2+x-2} dx$	(m) $\int \frac{\operatorname{sen}(x)}{\cos(x)(\cos(x)-1)} dx$
(c) $\int \frac{3}{x^2+x-2} dx$	(i) $\int \frac{x^2-4x+7}{x^3-x^2+x+3} dx$	(n) $\int \frac{e^x}{(e^x-1)(e^x+4)} dx$
(d) $\int \frac{x+1}{x^2+4x+3} dx$	(j) $\int \frac{x^2+x+2}{(x^2+2)^2} dx$	(o) $\int \frac{8x^3+13x}{(x^2+2)^2} dx$
(e) $\int \frac{5-x}{2x^2+x-1} dx$	(k) $\int \frac{2x^3-4x-8}{x(x-1)(x^2+4)} dx$	(p) $\int \frac{x}{(a+bx)^2} dx$
(f) $\int \frac{3x^2-7x-2}{x^3-x} dx$		