

5.- Calcular las primitivas de las funciones siguientes:

- a) $\int \frac{1}{\sqrt{2x-x^2}} dx$ **Sol:** $\arcsen(x-1) + C$ (alternativa: $2\arcsen\frac{\sqrt{x}}{\sqrt{2}} + C$)
- b) $\int \frac{x}{(\alpha^2+x^2)^n} dx$ **Sol:** $\frac{-1}{2(n-1)(\alpha^2+x^2)^{n-1}} + C$ ($n \neq 1$); $\frac{1}{2}\ln(\alpha^2+x^2)$ ($n = 1$)
- c) $\int \frac{1}{\cos^4 x} dx$ **Sol:** $\tan x + \frac{1}{3}\tan^3 x + C$
- d) $\int \frac{\cos^2(x/2)}{x+\sen x} dx$ **Sol:** $\frac{1}{2}\ln|x+\sen x| + C$
- e) $\int \frac{\sen x}{(1+\cos^2 x)} dx$ **Sol:** $-\arctan(\cos x) + C$
- f) $\int \sqrt{1+\sen 2x} dx$ **Sol:** $-\sqrt{1-\sen 2x} + C$ (alternativa: $\sen x - \cos x + C$)
- g) $\int (\cos^4 x - \sen^4 x) dx$ **Sol:** $\sen x \cos x + C$
- h) $\int \sqrt{\frac{1-x}{1+x}} dx$ **Sol:** $\arcsen x + \sqrt{1-x^2} + C$
- i) $\int \frac{1}{x\sqrt{1-\ln^2 x}} dx$ **Sol:** $\arcsen(\ln x) + C$
- j) $\int \frac{\cos \ln x}{x} dx$ **Sol:** $\sen(\ln x) + C$
- k) $\int \sqrt{1+\sen x} dx$ **Sol:** $-2\sqrt{1-\sen x} + C$ (alternativa: $2\sen\frac{x}{2} - 2\cos\frac{x}{2} + C$)
- l) $\int \cos^2 x dx$ **Sol:** $\frac{x}{2} + \frac{1}{4}\sen 2x + C$
- m) $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$ **Sol:** $2e^{\sqrt{x}} + C$
- n) $\int \left(\frac{\sec x}{1+\tan x}\right)^2 dx$ **Sol:** $\frac{-1}{1+\tan x} + C$

6.- Hallar las primitivas de las funciones siguientes::

a) $\int \frac{\sqrt{2+x^2} - \sqrt{2-x^2}}{\sqrt{4-x^4}} dx$

Sol: $\arcsen \frac{x}{\sqrt{2}} - \ln |x + \sqrt{2+x^2}| + C$

b) $\int (\tan x + \cotan x)^2 dx$

Sol: $\tan x - \cotan x + C$ (alternativa: $-2\cotan 2x + C$)

c) $\int 3^x e^x dx$

Sol: $\frac{3^x e^x}{1 + \ln 3} + C$

d) $\int \frac{\ln x + \sqrt{x}}{x} dx$

Sol: $\frac{1}{2} \ln^2 x + 2\sqrt{x} + C$

e) $\int \frac{(x^m - x^n)^2}{\sqrt{x}} dx$

Sol: $\frac{x^{2m+\frac{1}{2}}}{2m+\frac{1}{2}} + \frac{x^{2n+\frac{1}{2}}}{2n+\frac{1}{2}} - \frac{x^{m+n+\frac{1}{2}}}{m+n+\frac{1}{2}} + C$

f) $\int \frac{x^2}{1+x^6} dx$

Sol: $\frac{1}{3} \arctan x^3 + C$

g) $\int \sqrt{\frac{\arcsen x}{1-x^2}} dx$

Sol: $\frac{2}{3} (\arcsen x)^{3/2} + C$

h) $\int \frac{\arctan(x/2)}{4+x^2} dx$

Sol: $\frac{1}{4} \left(\arctan \frac{x}{2} \right)^2 + C$

i) $\int \frac{x - \sqrt{\arctan 2x}}{1+4x^2} dx$

Sol: $\frac{1}{8} \ln(1+4x^2) - \frac{1}{3} (\arctan 2x)^{3/2} + C$

j) $\int \frac{1}{\sqrt{(1+x^2) \ln(x+\sqrt{1+x^2})}} dx$

Sol: $2\sqrt{\ln(x+\sqrt{1+x^2})} + C$

k) $\int \sqrt{\frac{\ln(x+\sqrt{1+x^2})}{1+x^2}} dx$

Sol: $\frac{2}{3} \left[\ln \left(x + \sqrt{1+x^2} \right) \right]^{3/2} + C$

l) $\int \operatorname{senh}^2 x dx$

Sol: $\frac{1}{4} \operatorname{senh} 2x - \frac{x}{2} + C$

m) $\int \cosh^2 x dx$

Sol: $\frac{1}{4} \operatorname{senh} 2x + \frac{x}{2} + C$

n) $\int \frac{\alpha^{2x}-1}{\sqrt{\alpha^x}}, \alpha > 0 dx$

Sol: $\frac{\alpha^{3x/2}}{3/2 \ln \alpha} + \frac{\alpha^{-x/2}}{1/2 \ln \alpha} = \frac{2\alpha^{2x} + 6}{3\sqrt{\alpha^x} \ln \alpha} + C$
