1.– Solve the following integrals:

a) $\displaystyle\int (x\sqrt{1-x^2})\ dx$

b) $\displaystyle\int \frac{x^3-1}{x-1}\ dx$

c) $\displaystyle\int e^{2\ln x}\ dx$

d) $\displaystyle\int \sin x \sin(\cos x)\ dx$

e) $\displaystyle\int \frac{1-x^2}{x}\ dx$

f) $\displaystyle\int \sin x \sqrt[3]{1+\cos x}\ dx$

g) $\displaystyle\int \frac{x^2+3}{x^2-1}\ dx$

h) $\displaystyle\int (1-x^{-2})\sqrt{x\sqrt{x}}\ dx$

i) $\displaystyle\int \frac{\sin 2x}{1+\cos^2 x}\ dx$

j) $\displaystyle\int \frac{\cos^2 x}{\sqrt{1+\sin x}}\ dx$

k) $\displaystyle\int \frac{e^x}{1+e^{2x}}\ dx$

l) $\displaystyle\int \frac{1}{e^x\sqrt{1-e^{-2x}}}\ dx$

m) $\displaystyle\int \frac{\sqrt{x^4+x^{-4}+2}}{x^3}\ dx$

n) $\displaystyle\int \frac{\sec^2 x}{\sqrt{4-\tan^2 x}}\ dx$

2.– Obtain the primitives of the following functions:

a) $\displaystyle\int \frac{2^{x+1}-5^{x-1}}{10^x}\ dx$

b) $\displaystyle\int \frac{e^{3x}+1}{e^x+1}\ dx$

c) $\displaystyle\int \operatorname{cotan}^2 x\ dx$

d) $\displaystyle\int \tanh^2 x\ dx$

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

f) $\displaystyle\int \frac{\sqrt[5]{1-2x+x^2}}{1-x}\ dx$

g) $\displaystyle\int \frac{1}{2+3x^2}\ dx$

h) $\displaystyle\int \frac{1}{\sqrt{2-3x^2}}\ dx$

i) $\displaystyle\int \frac{1}{1+\cos x}\ dx$

j) $\displaystyle\int \frac{1}{\sinh^2 \frac{x}{2}}\ dx$

k) $\displaystyle\int \frac{x}{4+x^4}\ dx$

l) $\displaystyle\int \frac{1}{(1+x)\sqrt{x}}\ dx$

m) $\displaystyle\int \frac{1}{x^2 \operatorname{cosec} \frac{1}{x}}\ dx$

n) $\displaystyle\int \frac{\sin x}{\sqrt{\cos 2x}}\ dx$

3.– Solve the following integrals:

a) $\displaystyle\int \coth^2 x \, dx$

b) $\displaystyle\int \frac{1}{2-3x^2} \, dx$

c) $\displaystyle\int \frac{1}{\sqrt{3x^2-2}} \, dx$

d) $\displaystyle\int \frac{1}{1-\cos x} \, dx$

e) $\displaystyle\int \frac{x^3}{x^8-2} \, dx$

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

g) $\displaystyle\int \frac{1}{\sqrt{x(1+x)}} \, dx$

h) $\displaystyle\int \frac{\cos x}{\sqrt{\cos 2x}} \, dx$

i) $\displaystyle\int \frac{1}{\sin^2 x + 2\cos^2 x} \, dx$

j) $\displaystyle\int \frac{1}{\sinh x} \, dx$

k) $\displaystyle\int \frac{1}{\cosh x} \, dx$

l) $\displaystyle\int \frac{1+x}{1-x} \, dx$

m) $\displaystyle\int \frac{x^2}{1+x} \, dx$

n) $\displaystyle\int \frac{(1+x)^2}{1+x^2} \, dx$

4.– Integrate the following functions:

a) $\displaystyle\int \frac{x+\sqrt{1+x^2}}{\sqrt{1+x^2}} \, dx$

b) $\displaystyle\int \frac{1}{\cos x} \, dx$

c) $\displaystyle\int \frac{1}{\sqrt{a+x}+\sqrt{b+x}} \, dx$

d) $\displaystyle\int \frac{1}{\sin x \, \cos x} \, dx$

e) $\displaystyle\int \frac{1}{\sin x} \, dx$

f) $\displaystyle\int \tan^2 x \, dx$

g) $\displaystyle\int \frac{(\ln x)^n}{x} \, dx$

h) $\displaystyle\int \frac{1}{x(1+\ln x)^2} \, dx$

i) $\displaystyle\int \frac{1}{x(1+\ln^2 x)} \, dx$

j) $\displaystyle\int \frac{x}{\alpha^4+x^4} \, dx$

k) $\displaystyle\int \frac{1}{1+\sin x} \, dx$

l) $\displaystyle\int \frac{x}{1+x^2+\sqrt{1+x^2}} \, dx$

m) $\displaystyle\int (\cos^3 x - \sin^3 x) \, dx$

n) $\displaystyle\int \frac{1}{\sin 2x \ln \tan x} \, dx$

5.– Find the primitives of the following functions:

a) $\displaystyle\int \frac{1}{\sqrt{2x-x^2}}\,dx$

b) $\displaystyle\int \frac{x}{(\alpha^2+x^2)^n}\,dx$

c) $\displaystyle\int \frac{1}{\cos^4 x}\,dx$

d) $\displaystyle\int \frac{\cos^2(x/2)}{x+\sin x}\,dx$

e) $\displaystyle\int \frac{\sin x}{(1+\cos^2 x)}\,dx$

f) $\displaystyle\int \sqrt{1+\sin 2x}\,dx$

g) $\displaystyle\int (\cos^4 x-\sin^4 x)\,dx$

h) $\displaystyle\int \sqrt{\frac{1-x}{1+x}}\,dx$

i) $\displaystyle\int \frac{1}{x\sqrt{1-\ln^2 x}}\,dx$

j) $\displaystyle\int \frac{\cos\ln x}{x}\,dx$

k) $\displaystyle\int \sqrt{1+\sin x}\,dx$

l) $\displaystyle\int \cos^2 x\,dx$

m) $\displaystyle\int \frac{e^{\sqrt{x}}}{\sqrt{x}}\,dx$

n) $\displaystyle\int \left(\frac{\sec x}{1+\tan x}\right)^2 dx$

6.– Obtain the primitives of the following functions:

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

b) $\displaystyle\int (\tan x+\operatorname{cotan} x)^2\,dx$

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

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

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

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

g) $\displaystyle\int \sqrt{\frac{\arcsin x}{1-x^2}}\,dx$

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

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

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

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

l) $\displaystyle\int \sinh^2 x\,dx$

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

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