1.– Obtain the reduction formulas for the following integrals:

a) $I(n) = \displaystyle\int (\ln x)^n \, dx$ **b)** $I(n) = \displaystyle\int x^n e^{-x} \, dx$

c) $I(n) = \displaystyle\int x^n e^{-x^2} \, dx$ **d)** $I(n) = \displaystyle\int \frac{x^n}{\sqrt{a^2 - x^2}} \, dx$

2.– Find the reduction formulas for the following integrals:

a) $I(n) = \displaystyle\int \frac{\sin^n x}{\cos x} \, dx$ **b)** $I(n) = \displaystyle\int \frac{\cos^n x}{\sin x} \, dx$

c) $I(n) = \displaystyle\int \frac{1}{(1+x^2)^n} \, dx$ **d)** $I(n) = \displaystyle\int \frac{x^n}{x^2+1} \, dx$

3.– Obtain the reduction formulas for $I(n)$ y $J(n)$. Show that the second result can be obtained from the first.

a) $I(n) = \displaystyle\int \sin^n x \, dx\,; \quad J(n) = \int \frac{1}{\sin^n x} \, dx$

b) $I(n) = \displaystyle\int \cos^n x \, dx\,; \quad J(n) = \int \frac{1}{\cos^n x} \, dx$

4.– Find the reduction formulas for the following integrals:

a) $\displaystyle\int \arcsin^n x \, dx$ **b)** $\displaystyle\int \operatorname{argch}^n x \, dx$ **c)** $\displaystyle\int \tan^n x \, dx$

d) $\displaystyle\int \operatorname{cotan}^n x \, dx$ **e)** $\displaystyle\int \cosh^n x \, dx$ **f)** $\displaystyle\int (1+x^2)^n \, dx, \; n \in \mathbb{N}$

g) $\displaystyle\int x^n \sinh x \, dx$ **h)** $\displaystyle\int x^{2n} \cos x \, dx$ **i)** $\displaystyle\int x^\alpha \ln^n x \, dx, \; \alpha \in \mathbb{R}, \; n \in \mathbb{N}$
