

Ejercicio 1. Calcula las siguientes integrales por cambio de variable o sustitución:

$$1. \int x\sqrt{x-1} dx$$

$$\left[\text{Sol} : \frac{2\sqrt{(x-1)^5}}{5} - \frac{2\sqrt{(x-1)^3}}{3} + C \right]$$

$$11. \int \cos^2 x \sin^3 x dx$$

$$\left[\text{Sol} : \frac{3 \cos^5 x - 5 \cos^3 x}{15} + C \right]$$

$$2. \int x \cos(x^2 - 5) dx$$

$$\left[\text{Sol} : \frac{1}{2} \sin(x^2 - 5) + C \right]$$

$$12. \int \frac{e^x}{e^{2x} + e^x + 2} dx$$

$$\left[\text{Sol} : \frac{2}{\sqrt{7}} \operatorname{arctg} \left(\frac{2e^x + 1}{\sqrt{7}} \right) + C \right]$$

$$3. \int \frac{\operatorname{tg} x}{\cos x} dx$$

$$\left[\text{Sol} : \frac{1}{\cos x} + C \right]$$

$$13. \int \frac{1}{x + \sqrt{x}} dx$$

$$[\text{Sol} : 2 \ln(\sqrt{x} + 1) + C]$$

$$4. \int \frac{x}{\sqrt{1-x^4}} dx$$

$$\left[\text{Sol} : \frac{\operatorname{arcsen} x^2}{2} + C \right]$$

$$14. \int \frac{x}{\sqrt{4-x^2}} dx$$

$$[\text{Sol} : -\sqrt{4-x^2} + C]$$

$$5. \int \frac{dx}{x \ln x} \quad (x > 0)$$

$$[\text{Sol} : \ln(\ln x) + C]$$

$$15. \int \frac{x^3}{\sqrt{x-1}} dx$$

$$\left[\text{Sol} : \frac{2(x-1)^{\frac{7}{2}}}{7} + \frac{6(x-1)^{\frac{5}{2}}}{5} + 2(x-1)^{\frac{3}{2}} + 2(x-1)^{\frac{1}{2}} + C \right]$$

$$6. \int \frac{\ln^3 x}{x} dx$$

$$\left[\text{Sol} : \frac{\ln^4 |x|}{4} + C \right]$$

$$16. \int \cos^{-4} x dx$$

$$\left[\text{Sol} : \frac{\operatorname{tg}^3 x}{3} + \operatorname{tg} x + C \right]$$

$$7. \int \frac{\operatorname{tg} x + \operatorname{sen} x}{\cos x} dx$$

$$\left[\text{Sol} : \frac{1}{\cos x} - \ln |\cos x| + C \right]$$

$$17. \int \frac{3^x + 27^x}{1 + 9^x} dx$$

$$\left[\text{Sol} : \frac{3^x}{\ln 3} + C \right]$$

$$8. \int \operatorname{sen} x \cdot 2^{\cos x} dx$$

$$\left[\text{Sol} : -\frac{2^{\cos x}}{\ln 2} + C \right]$$

$$18. \int \frac{\sqrt{2x-3}}{\sqrt{2x-3}+1} dx$$

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

$$9. \int \frac{x}{\sqrt[3]{1+2x}} dx$$

$$\left[\text{Sol} : \frac{3\sqrt[3]{(1+2x)^5}}{20} - \frac{3\sqrt[3]{(1+2x)^2}}{8} + C \right]$$

$$19. \int \frac{dx}{x \ln^2 x}$$

$$\left[\text{Sol} : -\frac{1}{\ln |x|} + C \right]$$

$$10. \int x^3 \sqrt{x^2 - a^2} dx$$

$$\left[\text{Sol} : \frac{x^2 \sqrt{(x^2 - a^2)^3}}{5} + \frac{2a^2 \sqrt{(x^2 - a^2)^3}}{15} + C \right]$$

$$20. \int \frac{e^{-x}}{1 + e^{-x}} dx$$

$$[\text{Sol} : -\ln(e^{-x} + 1) + C]$$



$$21. \int \frac{dx}{(x+5)\sqrt{x+1}}$$
$$\left[\text{Sol : } \text{arctg} \left(\frac{\sqrt{x+1}}{2} \right) + C \right]$$

$$24. \int \frac{\sqrt{x}}{x+2} dx$$
$$\left[\text{Sol : } 2\sqrt{x} - 2\sqrt{2} \text{arctg} \left(\frac{\sqrt{x}}{\sqrt{2}} \right) + C \right]$$

$$22. \int \frac{\text{sen } 3x}{\sqrt[3]{1+3\cos 3x}} dx$$
$$\left[\text{Sol : } -\frac{\sqrt[3]{(3\cos 3x+1)^2}}{6} + C \right]$$

$$25. \int \frac{\sqrt{x^2+1}}{x} dx$$
$$\left[\text{Sol : } \sqrt{x^2+1} + \frac{1}{2} \ln \left(\frac{\sqrt{x^2+1}-1}{\sqrt{x^2+1}+1} \right) + C \right]$$

$$23. \int \frac{\sqrt[3]{1+\ln x}}{x} dx$$
$$\left[\text{Sol : } \frac{3\sqrt[3]{(\ln x+1)^4}}{4} + C \right]$$

$$26. \int \frac{dx}{x(\ln^2 x + 1)}$$
$$[\text{Sol : } \text{arctg}(\ln x) + C]$$

