



Ejercicio 1. Calcula las siguientes integrales racionales:

$$1. \int \frac{x^2 - 5x + 4}{x + 1} dx$$

$$\left[\text{Sol} : \frac{x^2}{2} - 6x + 10 \ln|x + 1| + C \right]$$

$$2. \int \frac{2x^2 + 2x + 4}{x + 1} dx$$

$$\left[\text{Sol} : \frac{x^2}{2} + x + 3 \ln|x + 1| + C \right]$$

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

$$\left[\text{Sol} : \frac{x^3}{3} - \frac{x^2}{2} - x - 3 \ln|x - 2| + C \right]$$

$$4. \int \frac{1}{x^2 + x - 6} dx$$

$$\left[\text{Sol} : -\frac{1}{5} \ln|x + 3| + \frac{1}{5} \ln|x - 2| + C \right]$$

$$5. \int \frac{3x^3}{x^2 - 4} dx$$

$$\left[\text{Sol} : \frac{3x^2}{2} + 6 \ln|x^2 - 4| + C \right]$$

$$6. \int \frac{1}{x^3 - 4x^2 - 25x + 100} dx$$

$$\left[\text{Sol} : \frac{\ln|x - 5|}{10} + \frac{\ln|x + 5|}{90} - \frac{\ln|x - 4|}{9} + C \right]$$

$$7. \int \frac{x^2 + 1}{x^2 + x} dx$$

$$\left[\text{Sol} : x + \ln|x| - 2 \ln|x + 1| + C \right]$$

$$8. \int \frac{x^4 + x^3 - x^2 - x + 3}{x^2 + x} dx$$

$$\left[\text{Sol} : \frac{x^3}{3} - x + 3 \ln|x| - 3 \ln|x + 1| + C \right]$$

$$9. \int \frac{4}{x^2 + x - 2} dx$$

$$\left[\text{Sol} : \frac{4}{3} \ln \left| \frac{x - 1}{x + 2} \right| + C \right]$$

$$10. \int \frac{x^2}{x^2 + 4x + 3} dx$$

$$\left[\text{Sol} : x - \frac{9 \ln|x + 3|}{2} + \frac{\ln|x + 1|}{2} + C \right]$$

$$11. \int \frac{x^3 - 2x^2 + x - 1}{x^2 - 3x + 2} dx$$

$$\left[\text{Sol} : \frac{x^2}{2} + x + \ln|x^2 - 3x + 2| + C \right]$$

$$12. \int \frac{-16}{x^2 - 2x - 15} dx$$

$$\left[\text{Sol} : 2 \ln \left| \frac{x + 3}{x - 5} \right| + C \right]$$

$$13. \int \frac{2x - 4}{(x - 1)^2(x + 3)} dx$$

$$\left[\text{Sol} : \frac{5}{8} \ln \left| \frac{x - 1}{x + 3} \right| + \frac{1}{2x - 2} + C \right]$$

$$14. \int \frac{2x + 3}{(x - 2)(x + 5)} dx$$

$$\left[\text{Sol} : \ln|(x - 2)(x + 5)| + C \right]$$

$$15. \int \frac{1}{(x - 1)(x + 3)^2} dx$$

$$\left[\text{Sol} : \frac{1}{16} \ln \left| \frac{x - 1}{x + 3} \right| + \frac{1}{4(x + 3)} + C \right]$$

$$16. \int \frac{3x - 2}{x^2 - 4} dx$$

$$\left[\text{Sol} : \ln(|x - 2|(x + 2)^2) + C \right]$$

$$17. \int \frac{x + 2}{x^2 + 1} dx$$

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

$$18. \int \frac{1}{(x^2 - 1)^2} dx$$

$$\left[\text{Sol} : -\frac{1}{4} \left(\ln \left| \frac{x - 1}{x + 1} \right| + \frac{2x}{x^2 - 1} \right) + C \right]$$

$$19. \int \frac{2x^2 + 7x - 1}{x^3 + x^2 - x - 1} dx$$

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

$$20. \int \frac{2x^2 + 5x - 1}{x^3 + x^2 - 2x} dx$$

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



$$21. \int \frac{dx}{x^2 - x - 2}$$

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

$$22. \int \frac{x^4 + 2x - 6}{x^3 + x^2 - 2x} dx$$

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

$$23. \int \frac{5x^2}{x^3 - 3x^2 + 3x - 1} dx$$

$$\left[\text{Sol} : 5 \ln |x-1| - \frac{10}{x-1} - \frac{5}{2(x-1)^2} + C \right]$$

$$24. \int \frac{2x-3}{x^3 - 2x^2 - 9x + 18} dx$$

$$\left[\text{Sol} : \frac{-\ln|x-2|}{5} + \frac{\ln|x-3|}{2} - \frac{3 \ln|x+3|}{10} + C \right]$$

$$25. \int \frac{x+1}{x^2 - 9x + 14} dx$$

$$\left[\text{Sol} : \frac{1}{5} \ln \left| \frac{(x-7)^8}{(x-2)^3} \right| + C \right]$$

$$26. \int \frac{2x-1}{x^3 + x^2 - 2x} dx$$

$$\left[\text{Sol} : -\frac{5 \ln|x+2|}{6} + \frac{\ln|x|}{2} + \frac{\ln|x-1|}{3} + C \right]$$

$$27. \int \frac{x^2 - 4}{x^3 + x^2 - x - 1} dx$$

$$\left[\text{Sol} : \frac{1}{4} \ln \left| \frac{(x+1)^7}{(x-1)^3} \right| - \frac{3}{2x+2} + C \right]$$

$$28. \int \frac{x+3}{x^3 - 3x^2 + 4x - 12} dx$$

$$\left[\text{Sol} : \frac{6 \ln|x-3|}{13} + \frac{3 \ln|x^2+4|}{13} - \frac{5}{26} \operatorname{arctg} \frac{x}{2} + C \right]$$

$$29. \int \frac{x-1}{x^2 - 5x + 6} dx$$

$$\left[\text{Sol} : 2 \ln \left| \frac{x-3}{x-2} \right| + C \right]$$

$$30. \int \frac{15x^2 - 4x - 81}{x^3 - 13x + 12} dx$$

$$\left[\text{Sol} : 7 \ln|x-1| + 3 \ln|x-3| + 5 \ln|x+4| + C \right]$$

$$31. \int \frac{x}{x^3 - 5x^2 + 8x - 4} dx$$

$$\left[\text{Sol} : -\frac{2}{x-2} - \ln|x-2| + \ln|x-1| + C \right]$$

$$32. \int \frac{x^2 - 1}{x^3 - 3x^2 + 3x - 1} dx$$

$$\left[\text{Sol} : -\frac{2}{x-1} + \ln|x-1| + C \right]$$

$$33. \int \frac{dx}{x^2 - 2x + 2}$$

$$\left[\text{Sol} : \operatorname{arctg}(x-1) + C \right]$$

$$34. \int \frac{3x+3}{x^2 + 2x + 2} dx$$

$$\left[\text{Sol} : \frac{3}{2} \ln|x^2 + 2x + 2| + C \right]$$

$$35. \int \frac{3x+4}{x^2 + 2x + 5} dx$$

$$\left[\text{Sol} : \frac{3}{2} \ln|x^2 + 2x + 5| + \frac{1}{2} \operatorname{arctg} \left(\frac{x+1}{2} \right) + C \right]$$

$$36. \int \frac{dx}{x^3 + x}$$

$$\left[\text{Sol} : \ln \left| \frac{x}{\sqrt{x^2+1}} \right| + C \right]$$

$$37. \int \frac{3x}{x^3 - 2x^2 + x - 2} dx$$

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