

1. $\int \frac{x}{x-6} dx$ $x-6 + 6 \ln x-6 + C$	11. $\int \frac{x+2}{x^2+x} dx$ $2 \ln x - \ln x+1 + C$
2. $\int \frac{x-9}{(x+5)(x-2)} dx$ $2 \ln x+5 - \ln x+2 + C$	12. $\int \frac{1}{x^2-8x+15} dx$ $\frac{1}{2} \ln x-5 - \frac{1}{2} \ln x-3 + C$
3. $\int \frac{1}{(x+4)(x-1)} dx$ $-\frac{1}{5} \ln x+4 + \frac{1}{5} \ln x-1 + C$	13. $\int \frac{x+2}{2x^2+3x+1} dx$ $\frac{3}{2} \ln 2x+1 - \ln x+1 + C$
4. $\int \frac{1}{x^2-1} dx$ $\frac{1}{2} \ln x-1 - \frac{1}{2} \ln x+1 + C$	14. $\int \frac{x}{x^2-3x+2} dx$ $2 \ln x-2 - 1 \ln x-1 + C$
5. $\int \frac{x-1}{x^2+3x+2} dx$ $3 \ln x+2 - 2 \ln x+1 + C$	15. $\int \frac{x^4+3x^3+2x^2+1}{x^2+3x+2} dx$ $\frac{1}{3} x^3 + \ln x+1 - \ln x+2 + C$
$\int \frac{x^3-4x-10}{x^2-x-6} dx$ $\frac{1}{2} x^2 + x + \ln x-3 + 2 \ln x+2 + C$	16. $\int \frac{1}{x^2+5x+4} dx$ $\frac{1}{3} \ln x+1 - \frac{1}{3} \ln x+4 + C$
7. $\int \frac{3x}{x^2-5x} dx$ $3 \ln x-5 + C$	17. $\int \frac{x^3}{x^2+3x+2} dx$ $\frac{1}{2} x^2 + 8 \ln x+2 - 1 \ln x+1 + C$
8. $\int \frac{x^2}{x+4} dx$ $\frac{1}{2} x^2 - 4x + 16 \ln x+4 + C$	18. $\int \frac{x^2+1}{x^2-3x+2} dx$ $x+5 \ln x-2 - 2 \ln x-1 + C$
9. $\int \frac{4x^2-7x-12}{x(x+2)(x-3)} dx$ $2 \ln x + \frac{9}{5} \ln x+2 + \frac{1}{5} \ln x-3 + C$	19. $\int \frac{dx}{x^2+x}$ $\ln x - \ln x+1 + C$
*10. $\int \frac{\sqrt{x+4}}{x} dx$ $2\sqrt{x+4} - 2 \ln \sqrt{x+4}+2 + 2 \ln \sqrt{x+4}-2 + C$	*20. $\int \frac{1}{ax^2+bx} dx$ $\frac{1}{b} \ln x - \frac{1}{b} \ln ax+b + C$

$$\int \frac{4x^2 - 7x - 12}{x(x+2)(x+3)} dx = 2 \ln|x| + \frac{9}{5} \ln|x+2| + \frac{1}{5} \ln|x-3| + C$$

$$4x^2 - 7x - 12 = A(x+2)(x-3) + B(x)(x-3) + C(x)(x+2)$$

$$\left. \begin{array}{l} x=0 \quad A=2 \\ x=-2 \quad B=\frac{9}{5} \\ x=-3 \quad C=\frac{1}{5} \end{array} \right\} \Rightarrow \int \frac{2}{x} + \frac{\left(\frac{9}{5}\right)}{(x+2)} + \frac{\left(\frac{1}{5}\right)}{(x-3)} dx$$

$$2 \ln|x| + \frac{9}{5} \ln|x+2| + \frac{1}{5} \ln|x-3| + C$$

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

$$\frac{2}{x^2+4x+3} = \frac{A}{(x+3)} + \frac{B}{(x+1)}$$

$$2 = A(x+1) + B(x+3)$$

$$x = -3 \Rightarrow 2 = A(-2) \quad x = -1 \Rightarrow 2 = B(2)$$

$\boxed{-1=A}$ $\boxed{1=B}$

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

$$-\ln|x+3| + \ln|x+1| + C$$