1. $\int 1/(x^2+4x-5)\,dx$

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

$$x^2+4x-5 = (x+5)(x-1) = \int \frac{1}{(x+5)(x-1)}\,dx$$

Buscar constante A y B

$$\frac{1}{(x+5)(x-1)} = \frac{A}{x+5} + \frac{B}{x-1} = 1 = A(x-1) + B(x+5)$$

$$1 = Ax - A + Bx + 5B = (A+B)x + (-A+5B)$$

- $A+B=0$
- $-A+5B=1$

$$-(-B) + 5B = 1 \rightarrow B + 5B = 1 \rightarrow 6B = 1 \rightarrow B =$$

Sustituir

$$\int \frac{1}{(x+5)(x-1)}\,dx = \int \left(\frac{-1}{6(x+5)} + \frac{1}{6(x-1)}\right) d$$

$$= -\frac{1}{6}\int \frac{1}{x+5}\,dx + \frac{1}{6}\int \frac{1}{x-1}\,dx$$

$$= -\frac{1}{6}\ln|x+5| + \frac{1}{6}\ln|x-1| + C$$

$$\int \frac{1}{x^2+4x-5}\,dx = \frac{1}{6}\ln\left|\frac{x-1}{x+5}\right| + C$$

2. $\int x / (x^2 - 10x + 30)\,dx$

$\int \frac{x}{x^2 - 10x + 30}$

$u = x^2 - 10x + 30 \Rightarrow \frac{du}{dx} = 2x \Rightarrow du = 2x\,dx \Rightarrow \frac{du}{2}$

$\int \frac{x}{x^2 - 10x + 30}\,dx = \int \frac{1}{u} \cdot \frac{du}{2} \quad \frac{1}{2}\int \frac{1}{u}\,du = \frac{1}{2}\ln|$

$= \frac{1}{2}\ln|x^2 - 10x + 30| + C$

3. $\int 1 / (x^2 + 6x + 10)\,dx$

$\int \frac{1}{x^2 + 6x + 10}\,dx$

$x^2 + 6x + 10 = (x+3)^2 + 1$

$u = x + 3 \Rightarrow du = dx$

$\int \frac{1}{(x+3)^2 + 1}\,dx = \int \frac{1}{u^2 + 1}\,du = \arctan(u) + C$

4. $\int (x^2 + 8x + 21)\,dx$ no es necesaria sustitución

* solo integrar

$\int x^2\,dx + \int 8x\,dx + \int 21\,dx = \frac{x^3}{3} + 4x^2 + 21x$

5. $\int 1 / (x^2 + 2x - 8)\,dx$

$\int \frac{1}{x^2 + 2x - 8}\,dx$

* Factorizar $\Rightarrow x^2 + 2x - 8 = (x+4)(x-2)$

$\frac{1}{(x+4)(x-2)} = \frac{A}{x+4} + \frac{B}{x-2} \Rightarrow A = \frac{1}{6},\ B = -\frac{1}{6}$

$\int \frac{1}{x^2 + 2x - 8}\,dx = \frac{1}{6}\ln\left|\frac{x+4}{x-2}\right| + C$

Norma

6. $\int 1/(x^2 - 8 + 20)\,dx$

$\int \frac{1}{x^2 - 8x + 20}$

$x^2 - 8x + 20 = (x-4)^2 + 4$

$u = = x - 4 \Rightarrow du = dx$

$\int \frac{1}{u^2+4}\,du = \int \frac{1}{u^2+2^2}\,du = \frac{1}{2}\arctan\left(\frac{u}{2}\right) + C$

7. $\int 1/(x^2 + 12x + 27)\,dx$

$\int \frac{1}{x^2+12x+27}\,dx$

$x^2 + 12x + 27 = (x+6)^2 - 9$

$\int \frac{1}{(x+6)^2 - 3^2}\,dx$

$\frac{1}{(x+6-3)(x+6+3)} = \frac{1}{(x+3)(x+9)}$

$\frac{1}{(x+3)(x+9)} = \frac{A}{x+3} + \frac{B}{x+9} \Rightarrow A = \frac{1}{6},\ B = -\frac{1}{6}$

$\int \frac{1}{x^2+12x+27}\,dx = \frac{1}{6}\ln\left|\frac{x+3}{x+9}\right| + C$

8. $\int 1/(x^2 - 10x + 16)\,dx$

$$\int \frac{1}{x^2 - 10x + 16}\,dx$$

$$x^2 - 10x + 16 = (x-2)(x-8)$$

$$\frac{1}{(x-2)(x-8)} = \frac{A}{x-2} + \frac{B}{x-8} \rightarrow A = \frac{1}{6},\ B = -\frac{1}{6}$$

$$\int \frac{1}{x^2 - 10x + 16}\,dx = \frac{1}{6} \ln\left|\frac{x-2}{x-8}\right| + C$$