$$\frac{p(x)}{q(x)} \Rightarrow \frac{x^1+1}{x^2+3}$$

$q(x) = 2$

$p(x) = 1$

$q(x) > p(x)$ $\quad$ $q(x) = p(x)$ $\quad$ $p(x) > q(x)$

$q(x) > p(x)$

I) EJEMPLO $q(x) > p(x)$

1) CASO: DENOMINADOR FACTORIZABLE DE GRADO 1

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

TRINOMIO

C.P

$-3 \cdot 2 = -6$

$-3 + 2 = -1$

$x^2 - x - 6$

$x \quad -3$

$x \quad 2$

$(x-3)(x+2)$

$2x - 3x = -x$

q (x) FACTORIZADO

$$\frac{A}{(x-3)} + \frac{B}{(x+2)}$$

$$\int \frac{dx}{x^2-x-6} = \int \frac{dx}{(x-3)(x+2)} = \int \frac{A}{(x-3)}dx + \int \frac{B}{(x+2)}dx$$

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

$$\frac{1}{(x-3)(x+2)} = \frac{A(x+2)+B(x-3)}{(x-3)(x+2)} \Big/ \cdot (x-3)(x+2)$$

$$\boxed{1 = A(\underset{-2}{x+2}) + B(\underset{3}{x-3})}$$

$x = -2$

$x = 3$

si $x = -2$

$1 = \cancel{A(-2+2)} + B(-2-3)$

$1 = -5B$

$\boxed{-1/5 = B}$

si $x = 3$

$1 = A(3+2) + \cancel{B(3-3)}$

$1 = 5A$

$\boxed{A = 1/5}$

$$\int \frac{A}{(x-3)}dx + \int \frac{B}{(x+2)}dx$$

$$\int \frac{1/5}{(x-3)}dx + \int \frac{-1/5}{(x+2)}dx$$

$$1/5 \int \frac{1}{(x-3)}dx - 1/5 \int \frac{1}{(x+2)}dx \qquad \int \frac{1}{x} = \ln|x|$$

$$\boxed{1/5 \cdot \ln|x-3| - 1/5 \cdot \ln|x+2| + C}$$

$u = x-3$

$du = dx$

$$1/5 \int \frac{1}{u}du = \frac{1}{5} \cdot \ln|u| + C = \boxed{\frac{1}{5} \cdot \ln|x-3| + C}$$