Calcular:

$$\int x^4\,dx$$

$$\int x^4\,dx = \frac{x^{4+1}}{4+1} = \frac{x^5}{5} + C$$

Calcular:

$$\int (x^3 + 2x)dx$$

$$\int (x^3 + 2x)dx = \int x^3\,dx + \int 2x\,dx = \int x^3\,dx + 2\int x\,dx =$$

$$= \frac{x^{3+1}}{3+1} + 2 \cdot \frac{x^{1+1}}{1+1} = \frac{x^4}{4} + x^2 + C$$

Calcular:

$$\int (\frac{1}{x^{-100}} + \frac{1}{x^{\sqrt{2}}})dx$$

$$\int (\frac{1}{x^{-100}} + \frac{1}{x^{\sqrt{2}}})dx = \int \frac{1}{x^{-100}}dx + \int \frac{1}{x^{\sqrt{2}}}dx = \int x^{100}dx + \int x^{-\sqrt{2}}\,dx$$

$$= \frac{x^{100}}{100+1} + \frac{x^{-\sqrt{2}}}{1-\sqrt{2}} + C = \frac{x^{101}}{101} + \frac{x^{-\sqrt{2}}}{1-\sqrt{2}} + C$$

Calcular:

$$\int (x^7 + 8x^3 + x^{-2})dx$$

$$\int (x^7 + 8x^3 + x^{-2})dx = \int x^7\,dx + \int 8x^3\,dx + \int x^{-2}\,dx =$$

$$\int x^7\,dx + 8\int x^3\,dx + \int x^{-2}\,dx = \frac{x^{7+1}}{7+1} + \frac{8x^{3+1}}{3+1} + \frac{x^{-2+1}}{-2+1} + C =$$

$$\frac{x^8}{8} + \frac{8x^4}{4} + \frac{x^{-2+1}}{-2+1} + C = \frac{x^8}{8} + 2x^4 + \frac{x^{-1}}{-1} + C = \frac{x^8}{8} + 2x^4 - \frac{1}{x} + C$$

Calcular:

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

$$\int (3x^2 + \frac{1}{x})dx = \int 3x^2dx + \int \frac{1}{x}dx = 3\int x^2dx + \int \frac{1}{x}dx$$

$$= 3\frac{x^{2+1}}{2+1} + ln|x| + C = x^3 + ln|x| + C$$

Calcular:

$$\int (x^{\pi} + x^e + x^i)dx$$

$$\int (x^{\pi} + x^e + x^i)dx = \int x^{\pi}dx + \int x^e\,dx + \int x^i\,dx =$$

$$= \frac{x^{\pi+1}}{\pi+1} + \frac{x^e}{e+1} + \frac{x^{i+1}}{i+1} + C$$

Calcular:

$$\int (x^{-6} - x^{-4} + x^{\sqrt{2}})dx$$

$$\int (x^{-6} - x^{-4} + x^{\sqrt{2}})dx = \int x^{-6}dx - \int x^{-4}\,dx + \int x^{\sqrt{2}}\,dx =$$

$$\frac{x^{-6+1}}{-6+1} - \frac{x^{-4+1}}{-4+1} + \frac{x^{\sqrt{2}+1}}{\sqrt{2}+1} + C = \frac{x^{-5}}{-5} - \frac{x^{-3}}{-3} + \frac{x^{\sqrt{2}+1}}{\sqrt{2}+1} + C$$

$$-\frac{1}{5x^5} + \frac{1}{3x^3} + \frac{x^{\sqrt{2}+1}}{\sqrt{2}+1} + C$$

Calcular:

$$\int cos5xdx$$

$$\int cos5xdx$$

Hacemos el cambio de variable:

$$sen5x = t$$

Derivamos para obtener dx:

$$5cos5xdx = dt$$

$$dx = \frac{dt}{5cos5x}$$

Sustituimos y deshacemos el cambio de variable:

$$\int cos5xdx = \int \frac{cos5xdt}{5cos5x} = \int \frac{dt}{5} = \frac{t}{5} + C = \frac{sen5x}{5} + C$$

Calcular:

$$\int \frac{\ln x dx}{x}$$

$$\int \frac{\ln x dx}{x}$$

Hacemos el cambio de variable:

$$\ln x = t$$

Derivamos para obtener dx:

$$\frac{dx}{x} = dt$$

$$dx = xdt$$

Sustituimos y deshacemos el cambio de variable:

$$\int \frac{\ln x dx}{x} = \int \frac{txdt}{x} = \int tdt = \frac{t^2}{2} + C = \frac{(\ln x)^2}{2} + C = \frac{ln^2 x}{2} + C$$