

Ejercicio

$$1. \int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$\int x^2 dx = \frac{x^{2+1}}{2+1} + C$$

$$= \frac{x^3}{3} + C$$

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

$$\boxed{R = \int x^2 dx = \frac{1}{3} x^3 + C}$$

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

$$\frac{1}{a^n} = a^{-n}$$

$$= x^{-1} + C$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$= -x^{-1} + C$$

$$\boxed{R = \int \frac{1}{x^2} dx = -\frac{1}{x} + C}$$

$$3. \int 2x^{2/3} dx = 2 \int x^{2/3} dx$$

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

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$= 2 \cdot \frac{x^{5/3}}{\frac{5}{3}} + C$$

$$= \frac{6}{5} x^{5/3} + C$$

$$\boxed{R = \int 2x^{2/3} dx = \frac{6}{5} x^{5/3} + C}$$

$$\begin{aligned}
 4. \int 3 \cdot x^4 dx &= 3 \int x^4 dx \\
 &= 3 \cdot \frac{x^{4+1}}{4+1} + C \\
 &= 3 \cdot \frac{x^5}{5} + C \\
 &= \frac{3}{5} x^5 + C
 \end{aligned}$$

$$R = \int 3x^4 dx = \frac{3}{5} x^5 + C$$

$$5. \int (12x^{-4} - 4x^{-3} + 9x^{-1} + 3) dx = \int 12x^{-4} dx - \int 4x^{-3} dx + \int 9x^{-1} dx + \int 3 dx$$

$$\int k \cdot f(x) dx = k \int f(x) dx = 12 \int x^{-4} dx - 4 \int x^{-3} dx + 9 \int x^{-1} dx + 3 \int dx$$

$$= 12 \cdot \frac{x^{-4+1}}{-4+1} - 4 \cdot \frac{x^{-3+1}}{-3+1} + 9 \int \frac{1}{x} dx + 3 \cdot x + C$$

$$= 12 \cdot \frac{x^{-3}}{-3} - 4 \cdot \frac{x^{-2}}{-2} + 9 \cdot \ln(x) + 3x + C$$

$$= -4x^{-3} + 2x^{-2} + 9 \cdot \ln(x) + 3x + C$$

$$R = \int (12x^{-4} - 4x^{-3} + 9x^{-1} + 3) dx = -4x^{-3} + 2x^{-2} + 9 \cdot \ln(x) + 3x + C$$

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

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

$$= \frac{4}{3} x^3 + \frac{2}{2} x^2 - x + 3 \cdot \ln|x| + C$$

$$\int \frac{4x^3 + 2x^2 - x + 3}{x} dx = \frac{4}{3} x^3 + x^2 - x + 3 \ln|x| + C$$

$$\begin{aligned}
 7. \int \frac{5w^2 + 7}{w^{4/3}} dw &= \int \frac{5w^2}{w^{4/3}} dw + \int \frac{7}{w^{4/3}} dw \\
 &= 5 \int w^2 \cdot w^{-4/3} dw + 7 \int w^{-4/3} dw \\
 &= 5 \int w^{2/3} dw + 7 \int w^{-4/3} dw \\
 &= 5 \cdot \frac{w^{2/3+1}}{\frac{2}{3}+1} + 7 \cdot \frac{w^{-4/3+1}}{-\frac{4}{3}+1} + C \\
 &= 5 \cdot \frac{w^{5/3}}{5/3} + 7 \cdot \frac{w^{-1/3}}{-1/3} + C \\
 &= 3 \cdot w^{5/3} + (-21) \cdot w^{-1/3} + C
 \end{aligned}$$

$$R = \int \frac{5w^2 + 7}{w^{4/3}} dw = 3 \cdot w^{5/3} - 21 \cdot w^{-1/3} + C$$

$$8. \int \frac{y^4 + 2y^2 - y + 5}{\sqrt{y}} dy$$

$$\begin{aligned}
 \sqrt{y} &= y^{1/2} \\
 \sqrt{a^m} &= a^{m/2} \\
 &= \int \frac{y^4}{y^{1/2}} dy + 2 \int \frac{y^2}{y^{1/2}} dy - \int \frac{y}{y^{1/2}} dy + 5 \int \frac{1}{y^{1/2}} dy \\
 &= \int y^{4-1/2} dy + 2 \int y^{2-1/2} dy - \int y^{1-1/2} dy + 5 \int y^{-1/2} dy \\
 &= \int y^{7/2} dy + 2 \int y^{3/2} dy - \int y^{1/2} dy + 5 \int y^{-1/2} dy \\
 &= \frac{y^{7/2+1}}{\frac{7}{2}+1} + 2 \cdot \frac{y^{3/2+1}}{\frac{3}{2}+1} - \frac{y^{1/2+1}}{\frac{1}{2}+1} + 5 \cdot \frac{y^{-1/2+1}}{-\frac{1}{2}+1} + C \\
 &= \frac{y^{9/2}}{9/2} + 2 \cdot \frac{y^{5/2}}{5/2} - \frac{y^{3/2}}{3/2} - 5 \cdot \frac{y^{1/2}}{1/2} + C \\
 &= \frac{2}{9} y^{9/2} + \frac{4}{5} y^{5/2} - \frac{2}{3} y^{3/2} - 10 y^{1/2} + C
 \end{aligned}$$

no tiene resultado

$$9. \int \frac{3}{x^5} dx = 3 \int \frac{1}{x^5} dx$$

$$= 3 \int x^{-5} dx$$

$$= \frac{3 \cdot x^{-5+1}}{-5+1} + C$$

$$= \frac{3x^{-4}}{-4} + C$$

$$= -\frac{3}{4} x^{-4} + C$$

$$\boxed{R = \int \frac{3}{x^5} dx = -\frac{3}{4x^4} + C}$$

$$10. \int \frac{x^2+1}{x} dx = \int \frac{x^2}{x} dx + \int \frac{1}{x} dx$$

$$= \int x dx + \int \frac{1}{x} dx$$

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

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

$$\boxed{R = \int \frac{x^2+1}{x} dx = \frac{1}{2} x^2 + \ln|x| + C}$$