

# UDS

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REPORTE DE LAS ACTIVIDADES

MATEMATICAS APLICADAS

Ejercicios

$$\textcircled{1} \int x^5 dx = \frac{x^6}{6} + C$$

$$u = x$$

$$M = 5$$

$$M+1 = 6$$

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

$$\int \sqrt[3]{x} dx = \int x^{1/3} dx = \frac{x^{4/3}}{4/3} + C$$

$$u = x$$

$$M = 1/3$$

$$M+1 = 4/3$$

$$= \frac{3 \times x^{4/3}}{4}$$

$$= \frac{3 \sqrt[3]{x^4}}{4} + C$$

$$\textcircled{3} \int \frac{dx}{\sqrt[3]{x^2}} = \int \frac{dx}{x^{2/3}} = \frac{x^{1/3}}{1/3} + C = 3 \sqrt[3]{x} + C$$

$$u = x$$

$$M = 2/3$$

$$M+1 = 5/3$$

$$\frac{-2}{3} + \frac{3}{3} = \frac{1}{3}$$

$$\textcircled{6} a^3 \int dx + 3a^2 \int x dx + 3a \int x^2 dx + \int x^3 dx$$

$$a^3 x + \frac{3ax^2}{2} + \frac{3ax^3}{3} + \frac{x^4}{4} + C$$

$$a^3 x + \frac{3ax^2}{2} + ax^3 + \frac{x^4}{4} + C$$

$$\textcircled{7} \int (3x+4)^2 dx \quad (3x+4)(3x+4)$$

$$\int 9x^2 + 24x + 16 dx \quad 9x^3 + 24x + 16$$

$$\textcircled{8} 9 \int x^2 dx + 24 \int x dx + 16 \int dx$$

$$\frac{9x^3}{3} + \frac{24x^2}{2} + 16x + C$$

$$3x^3 + 12x^2 + 16x + C$$

$$\textcircled{9} \int \frac{x^3 + 5x^2 - 4}{x^2} dx$$

$$\int \frac{x^3 dx}{x^2} + 5 \int \frac{x^2 dx}{x^2} - 4 \int \frac{dx}{x^2}$$

$$4) \int (2x^2 - 5x + 3) dx$$

$$\int 2x^2 dx - \int 5x dx + \int 3 dx$$

$$2 \int x^2 dx - 5 \int x dx + 3 \int dx$$

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

$$\int u^m du = \frac{u^{m+1}}{m+1}$$

$$5) \int (1-x) \sqrt{x} dx$$

$$(1+x) \sqrt{x}$$

$$(1+x) x^{1/2}$$

$$\int x^{1/2} + x^{3/2} dx$$

$$\int \frac{1}{2} x^{1/2} dx + \int \frac{3}{2} x^{3/2} dx = \frac{x^{3/2}}{\frac{3}{2}} - \frac{x^{5/2}}{\frac{5}{2}} + C$$

$$x^{-2} dx = x^{-1} = \frac{1}{x}$$

$$\boxed{\frac{x^2}{2} + 5x + \frac{4}{x} + C}$$

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

$$1 + 2x + x^2 = \frac{1}{x^{1/2}} + \frac{2x}{x^{1/2}} + \frac{x^2}{x}$$
$$x^{-1/2} + 2x(x^{-1/2}) + x^2(x^{-1/2})$$

$$\int (x^{-1/2} + 2x^{1/2}) dx$$

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

$$2\sqrt{x} + \frac{3}{4}\sqrt{x^3} + 2\frac{\sqrt{x^5}}{5} +$$

$$\int \left( \sqrt{x} - \frac{1}{2} \times \frac{2}{\sqrt{x}} \right) dx$$

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

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

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

$$\int \frac{x^{3/2}}{3/2} - \frac{1}{2} \int \frac{x^2}{2} + 2 \int \frac{x^{1/2}}{1/2}$$

$$\frac{2x^{3/2}}{3} - \frac{1}{2} \cdot \frac{x^2}{2} + 4\sqrt{x} + C$$

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

$$\textcircled{10} \int \frac{dx}{\sqrt{x^2}} \quad \int \frac{dx}{x^{1/2}} \quad \int x^{-2/3} dx = \frac{x^{1/3}}{1/3} + C = 3\sqrt[3]{x} + C$$

$$\begin{aligned} u &= x \\ n &= \frac{2}{3} \\ n+1 &= \frac{5}{3} \quad \frac{-2}{3} + \frac{3}{3} = \frac{1}{3} \end{aligned}$$

$$\textcircled{11} \int (2x^2 - 5x + 3) dx = \int 2x^2 dx - \int 5x dx + 2 \int x^2 dx - 5 \int x dx + 3 \int dx$$

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

$$\textcircled{12} \int (1-x) \sqrt{x} dx = \int (-x) \sqrt{x}$$

$$\frac{2}{2} + \frac{1}{2} = \frac{3}{2}$$

$$\int x^{1/2} - x^{3/2} dx = \frac{x^{3/2}}{3/2} - \frac{x^{5/2}}{5/2} + C$$

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

$$\int \frac{(1 + \sqrt{x})^2 dx}{\sqrt{x}} \quad \begin{matrix} (1+x^{1/2}) & (1+x^{1/2}) \\ 1+x^{1/2}+1+x^{1/2}+x^{1/2} \\ \int \frac{1+2x^{1/2}+x}{x^{1/2}} dx \end{matrix}$$

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

$$\int \frac{x^2 - 2x - 1 \times 2}{\sqrt{x}} dx \quad \int \frac{x^2 - 2x - 2}{\sqrt{x}} dx$$

$$= \int x^2 \cdot x^{-1/2} dx - \int x \cdot x^{-1/2} dx - 2 \int x^{-1/2} dx$$

$$= \int x^{3/2} dx - \int x^{1/2} dx - \int x^{-1/2} dx$$

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

$$\int \frac{dx}{x-1}$$