

Tema 11: Cálculo de primitivas

Soluciones das integrais propostas na páxina 327:

■ NÚMEROS Y POTENCIAS SENCILLAS

$$\text{a) } \int 1 \, dx = x$$

$$\text{b) } \int 2 \, dx = 2x$$

$$\text{c) } \int \sqrt{2} \, dx = \sqrt{2}x$$

$$\text{d) } \int 2x \, dx = x^2$$

$$\text{e) } \int x \, dx = \frac{x^2}{2}$$

$$\text{f) } \int 3x \, dx = \frac{3x^2}{2}$$

$$\text{g) } \int 7x \, dx = \frac{7x^2}{2}$$

$$\text{h) } \int x^2 \, dx = \frac{x^3}{3}$$

$$\text{i) } \int \frac{1}{2}x^2 \, dx = \frac{x^3}{6}$$

■ POTENCIAS DE EXPONENTE ENTERO

$$\text{a) } \int (-1)x^{-2} \, dx = x^{-1} = \frac{1}{x}$$

$$\text{b) } \int x^{-2} \, dx = \frac{x^{-1}}{-1} = -\frac{1}{x}$$

$$\text{c) } \int \frac{5}{x^2} \, dx = \frac{-5}{x}$$

$$\text{d) } \int \frac{1}{x^3} \, dx = \int x^{-3} \, dx = \frac{x^{-2}}{-2} = -\frac{1}{2x^2}$$

$$\text{e) } \int \frac{2}{x^3} \, dx = 2 \int \frac{1}{x^3} \, dx = \frac{-2}{2x^2} = -\frac{1}{x^2}$$

$$\text{f) } \int \frac{5}{(x-3)^3} \, dx = \frac{-5}{2(x-3)^2}$$

■ LAS RAICES TAMBIEN SON POTENCIAS

$$\text{a) } \int \frac{3}{2}x^{1/2} \, dx = x^{3/2} = \sqrt{x^3}$$

$$\text{d) } \int \frac{1}{2}x^{-1/2} \, dx = x^{1/2} = \sqrt{x}$$

$$\text{b) } \int \frac{3}{2}\sqrt{x} \, dx = \int \frac{3}{2}x^{1/2} \, dx = x^{3/2} = \sqrt{x^3}$$

$$\text{e) } \int \frac{1}{2\sqrt{x}} \, dx = \sqrt{x}$$

$$\text{c) } \int 7\sqrt{x} \, dx = 7 \int \sqrt{x} \, dx = \frac{14}{3}\sqrt{x^3}$$

$$\text{f) } \int 5\sqrt{x^3} \, dx = 5 \int x^{3/2} \, dx = 5 \frac{x^{5/2}}{5/2} = 2\sqrt{x^5}$$

■ ¿RECUERDAS QUE $D(\ln x) = \frac{1}{x}$?

$$\text{a) } \int \frac{1}{x} \, dx = \ln |x|$$

$$\text{b) } \int \frac{1}{5x} \, dx = \frac{1}{5} \int \frac{5}{5x} \, dx = \frac{1}{5} \ln |5x|$$

$$\text{c) } \int \frac{1}{x+5} \, dx = \ln |x+5|$$

$$\text{d) } \int \frac{3}{2x+6} \, dx = \frac{3}{2} \int \frac{2}{2x+6} \, dx = \frac{3}{2} \ln |2x+6|$$

■ ALGUNAS FUNCIONES TRIGONOMÉTRICAS

a) $\int \cos x \, dx = \text{sen } x$

b) $\int 2\cos x \, dx = 2\text{sen } x$

c) $\int \cos\left(x + \frac{\pi}{2}\right) dx = \text{sen}\left(x + \frac{\pi}{2}\right)$

d) $\int \cos 2x \, dx = \frac{1}{2} \int 2\cos 2x \, dx = \frac{1}{2} \text{sen } 2x$

e) $\int (-\text{sen } x) \, dx = \cos x$

f) $\int \text{sen } x \, dx = -\cos x$

g) $\int \text{sen}(x - \pi) \, dx = -\cos(x - \pi)$

h) $\int \text{sen } 2x \, dx = \frac{1}{2} \int 2\text{sen } 2x \, dx = \frac{-1}{2} \cos 2x$

i) $\int (1 + \text{tg}^2 2x) \, dx = \frac{1}{2} \int 2(1 + \text{tg}^2 2x) \, dx = \frac{1}{2} \text{tg } 2x$

j) $\int \text{tg}^2 2x \, dx = \int (1 + \text{tg}^2 2x - 1) \, dx = \int (1 + \text{tg}^2 2x) \, dx - \int 1 \, dx = \frac{1}{2} \text{tg } 2x - x$

■ ALGUNAS EXPONENCIALES

a) $\int e^{x-1} \, dx = e^{x-1}$

b) $\int e^{2x+1} \, dx = \frac{1}{2} e^{2x+1}$