INTEGRAL DEFINIDA.

$$\int_a^b f(x)\,dx = [F(x)+K]_a^b = (F(b)+K)-(F(a)+K) = F(b)+K-F(a)-K = F(b)-F(a)$$

$$\int f(x)\,dx = F(x)+K$$

Al resolver integrales definidas, no es necesario poner la constante de integración.

$$\int_0^5 (3x^2-4x+1)dx = [x^3-2x^2+x]_0^5 = (5^3-2\cdot 5^2+5)-(0^3-2\cdot 0^2+0) = 80$$

Pág. 379, 1

$$a)\ \int_0^2 \frac{x}{\sqrt{x^2+1}}dx = \left[\sqrt{x^2+1}\right]_0^2 = \left(\sqrt{2^2+1}\right)-\left(\sqrt{0^2+1}\right) = \sqrt{5}-1$$

$$\int \frac{x}{\sqrt{x^2+1}}dx = \left\{\begin{matrix} t = x^2+1 & \\ dt = 2x\,dx & \frac{dt}{2} = x\,dx \end{matrix}\right\} = \int \frac{\frac{dt}{2}}{\sqrt{t}} = \int \frac{dt}{2\sqrt{t}} = \sqrt{t} = \sqrt{x^2+1}$$

Martes, 26 de mayo

$$b)\ \int_1^4 \frac{x-1}{\sqrt{x}}dx = \left[\frac{2}{3}\sqrt{x^3}-2\sqrt{x}\right]_2^4 = \left(\frac{2}{3}\sqrt{4^3}-2\sqrt{4}\right)-\left(\frac{2}{3}\sqrt{2^3}-2\sqrt{2}\right) = \frac{4-10\sqrt{2}}{3} = -3'3807$$

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

$$\int \frac{x-1}{\sqrt{x}}dx = \int\left(x^{\frac{1}{2}}-\frac{1}{\sqrt{x}}\right)dx = \int x^{\frac{1}{2}}\,dx - 2\int\frac{1}{2\sqrt{x}}\,dx = \frac{x^{\frac{1}{2}+1}}{\frac{1}{2}+1}-2\sqrt{x} = \frac{2}{3}\sqrt{x^3}-2\sqrt{x}$$

$$c)\ \int_{\frac{1}{e}}^{e} 2Ln\,x\,dx = [2(x\,Ln\,x-x)]_{\frac{1}{e}}^{e} = (2(e\,Ln\,e-e))-\left(2\left(\frac{1}{e}Ln\frac{1}{e}-\frac{1}{e}\right)\right) = 0-(-1'4715) = 1'4715 = \frac{2}{e}$$

$$\int 2Ln\,x\,dx = 2\int Ln\,x\,dx = \left\{\begin{matrix} u = Ln\,x & \rightarrow & du = \frac{1}{x}dx \\ dv = dx & \rightarrow & v = x \end{matrix}\right\} = 2\left(x\,Ln\,x - \int x\frac{1}{x}\,dx\right) = 2(x\,Ln\,x - x)$$

$$d)\ \int_{-\sqrt{3}}^{\sqrt{3}} \frac{x^2}{x^2+1}dx = [x-arctg\ x]_{-\sqrt{3}}^{\sqrt{3}} = \left(\sqrt{3}-arctg\ \sqrt{3}\right)-\left(-\sqrt{3}-arctg\ \left(-\sqrt{3}\right)\right) = 1'3697 =$$

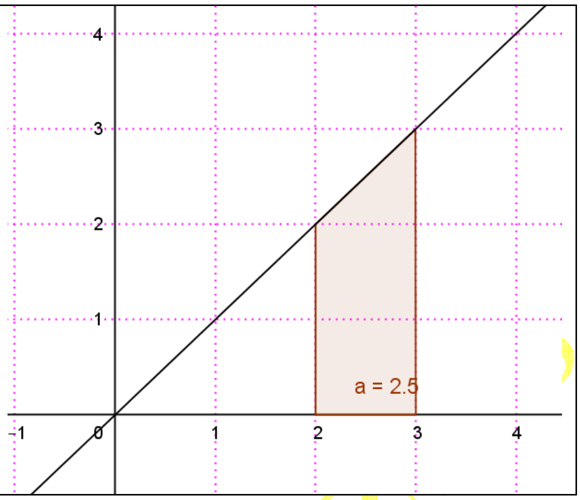
$$= \sqrt{3}-\frac{\pi}{3}+\sqrt{3}-\frac{\pi}{3} = 2\sqrt{3}-\frac{2\pi}{3}$$

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

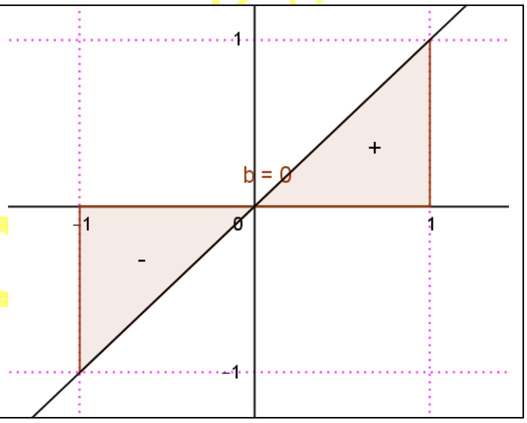
$$\frac{x^2}{x^2+1} = \frac{x^2+1-1}{x^2+1} = \frac{x^2+1}{x^2+1}-\frac{1}{x^2+1} = 1-\frac{1}{x^2+1}$$

Integral definida – áreas.

$$\int_{2}^{3} x\,dx = \left[\frac{x^2}{2}\right]_2^3 = \frac{3^2}{2} - \frac{2^2}{2} = \frac{5}{2}$$



$$\int_{-1}^{1} x\,dx = \left[\frac{x^2}{2}\right]_{-1}^{1} = \frac{1^2}{2} - \frac{(-1)^2}{2} = 0$$



$$\int_{-2}^{0} x\,dx = \left[\frac{x^2}{2}\right]_{-2}^{0} = \frac{0^2}{2} - \frac{(-2)^2}{2} = -2$$