FORMULARIO BÁSICO CÁLCULO DIFERENCIAL E INTEGRAL

DERIVADAS

ALGEBRAICAS

$$\frac{d}{dx}c = 0$$

$$\frac{d}{dx}x = 1$$

$$\frac{d}{dx}(u + v - w) = \frac{du}{dx} + \frac{dv}{dx} - \frac{dw}{dx}$$

$$\frac{d}{dx}(c\,u) = c\frac{du}{dx}$$

$$\frac{d}{dx}(u\,v) = u\frac{dv}{dx} + v\frac{du}{dx}$$

$$\frac{d}{dx}u^n = n\,u^{n-1}\frac{du}{dx}$$

$$\frac{d}{dx}\frac{u}{c} = \frac{\frac{du}{dx}}{c}$$

$$\frac{d}{dx}\frac{u}{v} = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$$

$$\frac{d}{dx}\sqrt{u} = \frac{\frac{du}{dx}}{2\sqrt{u}}$$

EXPONENTES Y LOGARITMOS

$$\frac{d}{dx}\ln u = \frac{1}{u}\frac{du}{dx}$$

$$\frac{d}{dx}\log u = \frac{1}{u}\log e\,\frac{du}{dx}$$

$$\frac{d}{dx}e^u = e^u\frac{du}{dx}$$

$$\frac{d}{dx}a^u = a^u \ln a\frac{du}{dx}$$

$$\frac{d}{dx}u^v = v\,u^{v-1}\frac{du}{dx} + u^v \ln u\frac{dv}{dx}$$

TRIGONOMÉTRICAS

$$\frac{d}{dx}\text{Sen}\,u = \text{Cos}\,u\frac{du}{dx}$$

$$\frac{d}{dx}\text{Cos}\,u = -\text{Sen}\,u\frac{du}{dx}$$

$$\frac{d}{dx}\text{Tg}\,u = \text{Sec}^2 u\frac{du}{dx}$$

$$\frac{d}{dx}\text{Ctg}\,u = -\text{Csc}^2 u\frac{du}{dx}$$

$$\frac{d}{dx}\text{Sec}\,u = \text{Sec}\,u\,\text{Tg}\,u\frac{du}{dx}$$

$$\frac{d}{dx}\text{Csc}\,u = -\text{Csc}\,u\,\text{Ctg}\,u\frac{du}{dx}$$

$$\frac{d}{dx}\text{arc Sen}\,u = \frac{du/dx}{\sqrt{1-u^2}}$$

$$\frac{d}{dx}\text{arc Cos}\,u = -\frac{du/dx}{\sqrt{1-u^2}}$$

$$\frac{d}{dx}\text{arc Tg}\,u = \frac{du/dx}{1+u^2}$$

$$\frac{d}{dx}\text{arc Ctg}\,u = -\frac{du/dx}{1+u^2}$$

$$\frac{d}{dx}\text{arc Sec}\,u = \frac{du/dx}{u\sqrt{u^2-1}}$$

$$\frac{d}{dx}\text{arc Csc}\,u = -\frac{du/dx}{u\sqrt{u^2-1}}$$

$$\frac{d}{dx}\text{arc vers}\,u = \frac{du/dx}{\sqrt{2u-u^2}}$$

INTEGRALES

ALGEBRAICAS, EXPONENCIALES Y LOGARÍTMICAS

$$\int du = u + c$$

$$\int c\,du = c\int du$$

$$\int (du + dv - dw) = \int du + \int dv - \int dw$$

$$\int u^n\,du = \frac{u^{n+1}}{n+1} + c$$

$$\int \frac{du}{u} = \ln u + c$$

$$\int e^u\,du = e^u + c$$

$$\int a^u\,du = \frac{a^u}{\ln a} + c$$

$$\int \ln u\,du = u\left[\ln(u-1)\right]$$

$$\int u\,a^u\,du = e^u(u-1)$$

TRIGONOMÉTRICAS

$$\int \text{Sen}\,u\,du = -\text{Cos}\,u + c$$

$$\int \text{Cos}\,u\,du = \text{Sen}\,u + c$$

$$\int \text{Tg}\,u\,du = \ln(\text{Sec}\,u) = -\ln(\text{Cos}\,u) + c$$

$$\int \text{Ctg}\,u\,du = \ln(\text{Sen}\,u) + c$$

$$\int \text{Sec}\,u\,du = \ln(\text{Sec}\,u + \text{Tg}\,u) + c$$

$$\int \text{Csc}\,u\,du = \ln(\text{Csc}\,u - \text{Ctg}\,u) + c$$

$$\int \text{Sec}^2 u\,du = \text{Tg}\,u + c$$

$$\int \text{Csc}^2 u\,du = -\text{Ctg}\,u + c$$

$$\int \text{Sec}\,u\,\text{Tg}\,u\,du = \text{Sec}\,u + c$$

$$\int \text{Csc}\,u\,\text{Ctg}\,u\,du = -\text{Csc}\,u + c$$

$$\int \frac{du}{u^2+a^2} = \frac{1}{a}\,\text{arctg}\,\frac{u}{a} + c$$

$$\int \frac{du}{u^2-a^2} = \frac{1}{2a}\ln\left(\frac{u-a}{u+a}\right) + c$$

$$\int \frac{du}{a^2-u^2} = \frac{1}{2a}\ln\left(\frac{a+u}{a-u}\right) + c$$

$$\int \frac{du}{\sqrt{a^2-u^2}} = \text{arc Sen}\,\frac{u}{a} + c$$

$$\int \frac{du}{\sqrt{u^2 \pm a^2}} = \ln\left(u + \sqrt{u^2 \pm a^2}\right) + c$$

$$\int \sqrt{a^2-u^2}\,du = \left(\frac{1}{2}u\sqrt{a^2-u^2} + \frac{a^2}{2}\,\text{arcSen}\,\frac{u}{a}\right) + c$$

$$\int \sqrt{u^2 \pm a^2}\,du = \left(\frac{1}{2}u\sqrt{u^2 \pm a^2} \pm \frac{a^2}{2}\ln\left(u + \sqrt{u^2 \pm a^2}\right)\right) + c$$

$$\int \frac{du}{u\sqrt{u^2-a^2}} = \frac{1}{a}\,\text{arc Sec}\,\frac{u}{a} + c$$

INTEGRACIÓN POR PARTES

Escoger u y dv. Siempre en dv debe ir dx.

$$\int u\,dv = u\,v - \int v\,du$$

1 radián = 57.3°

VÉRTICE DE UNA PARÁBOLA

$$V\left(\frac{-b}{2a}\quad\frac{4ac-b^2}{4a}\right)$$

FÓRMULA GRAL. ECUACIONES DE SEGUNDO GRADO

$$X = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

PROPIEDADES DE LOGARITMOS

$$\log A + \log B = \log AB$$

$$\log A - \log B = \log\frac{A}{B}$$

$$\log A^n = n\log A$$

FUNCIONES TRIGONOMÉTRICAS

$$\text{Sen}\,x = \frac{1}{\text{Csc}\,x} = \frac{\text{Cos}\,x}{\text{Ctg}\,x} = \frac{\text{Tg}\,x}{\text{Sec}\,x}$$

$$\text{Cos}\,x = \frac{1}{\text{Sec}\,x} = \frac{\text{Ctg}\,x}{\text{Csc}\,x} = \frac{\text{Sen}\,x}{\text{Tg}\,x}$$

$$\text{Tg}\,x = \frac{\text{Sen}\,x}{\text{Cos}\,x} = \frac{\text{Sec}\,x}{\text{Csc}\,x} = \frac{1}{\text{Ctg}\,x}$$

$$\text{Ctg}\,x = \frac{\text{Cos}\,x}{\text{Sen}\,x} = \frac{\text{Csc}\,x}{\text{Sec}\,x} = \frac{1}{\text{Tg}\,x}$$

$$\text{Sec}\,x = \frac{1}{\text{Cos}\,x} = \frac{\text{Tg}\,x}{\text{Sen}\,x} = \frac{\text{Csc}\,x}{\text{Ctg}\,x}$$

$$\text{Csc}\,x = \frac{1}{\text{Sen}\,x} = \frac{\text{Sec}\,x}{\text{Tg}\,x} = \frac{\text{Ctg}\,x}{\text{Cos}\,x}$$

$$\text{Sen}^2 x + \text{Cos}^2 x = 1$$

$$\text{Ctg}^2 x = \text{Csc}^2 x - 1$$

$$\text{Tg}^2 x = \text{Sec}^2 x - 1$$

$$\text{Sen}^2 x = \tfrac{1}{2} - \tfrac{1}{2}\text{Cos}\,2x$$

$$\text{Cos}^2 x = \tfrac{1}{2} + \tfrac{1}{2}\text{Cos}\,2x$$

$$\text{Sen}(A+B) = \text{Sen}\,A\,\text{Cos}\,B + \text{Cos}\,A\,\text{Sen}\,B$$

$$\text{Sen}(A-B) = \text{Sen}\,A\,\text{Cos}\,B - \text{Sen}\,B\,\text{Cos}\,A$$

$$\text{Cos}(A+B) = \text{Cos}\,A\,\text{Cos}\,B - \text{Sen}\,A\,\text{Sen}\,B$$

$$\text{Cos}(A-B) = \text{Cos}\,A\,\text{Cos}\,B + \text{Sen}\,A\,\text{Sen}\,B$$

$$\text{Tg}(A+B) = \frac{\text{Tg}\,A + \text{Tg}\,B}{1 - \text{Tg}\,A\,\text{Tg}\,B}$$

$$\text{Tg}(A-B) = \frac{\text{Tg}\,A - \text{Tg}\,B}{1 + \text{Tg}\,A\,\text{Tg}\,B}$$

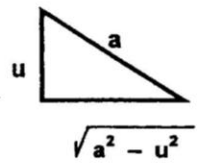
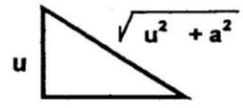
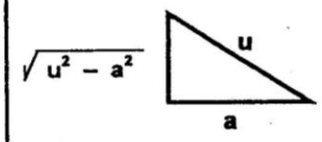
$$\text{Sen}\,2x = 2\,\text{Sen}\,x\,\text{Cos}\,x$$

$$\text{Cos}\,2x = \text{Cos}^2 x - \text{Sen}^2 x$$

$$\text{Tg}\,2x = \frac{2\,\text{Tg}\,x}{1 - \text{Tg}^2 x}$$

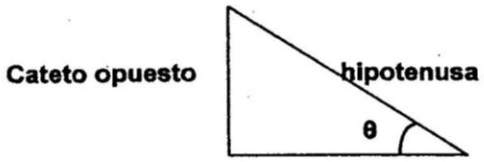
FORMULARIO BÁSICO DE CÁLCULO DIFERENCIAL E INTEGRAL

MÉTODO DE INTEGRACIÓN POR SUSTITUCIÓN TRIGONOMÉTRICA

FORMA DEL RADICAL	RELACIÓN TRIGONOMÉTRICA	SUSTITUCIONES
I $\sqrt{a^2 - u^2}$		$u = a \operatorname{Sen} \theta$ $du = a \operatorname{Cos} \theta \, d\theta$ $\sqrt{a^2 - u^2} = a \operatorname{Cos} \theta$
II $\sqrt{u^2 + a^2}$		$u = a \operatorname{Tg} \theta$ $du = a \operatorname{Sec}^2 \theta \, d\theta$ $\sqrt{u^2 + a^2} = a \operatorname{Sec} \theta$
III $\sqrt{u^2 - a^2}$		$u = a \operatorname{Sec} \theta$ $du = a \operatorname{Sec} \theta \operatorname{Tg} \theta \, d\theta$ $\sqrt{u^2 - a^2} = a \operatorname{Tg} \theta$

TEOREMA DE PITÁGORAS

$$\text{Hipotenusa} = \sqrt{\text{c. opuesto}^2 + \text{c. adyacente}^2}$$



FUNCIONES TRIGONOMÉTRICAS, DE ACUERDO AL TEOREMA DE PITÁGORAS

$$\operatorname{Sen} \theta = \frac{\text{c. opuesto}}{\text{hipotenusa}} \qquad \operatorname{Ctg} \theta = \frac{\text{c. adyacente}}{\text{c. opuesto}}$$

$$\operatorname{Cos} \theta = \frac{\text{c. adyacente}}{\text{hipotenusa}} \qquad \operatorname{Sec} \theta = \frac{\text{hipotenusa}}{\text{c. adyacente}}$$

$$\operatorname{Tg} \theta = \frac{\text{c. opuesto}}{\text{c. adyacente}} \qquad \operatorname{Csc} \theta = \frac{\text{hipotenusa}}{\text{c. opuesto}}$$