

EXPRESIONES ÚTILES

Funciones circulares

$$\sin^2 x + \cos^2 x = 1$$

$$\sin(x + y) = \sin x \cos y + \cos x \sin y$$

$$\cos(x + y) = \cos x \cos y - \sin x \sin y$$

$$\tan(x + y) = \frac{\tan x + \tan y}{1 - \tan x \tan y}$$

$$\sin^2 x = \frac{1 - \cos 2x}{2}$$

$$\sin^2 x = \frac{\tan^2 x}{1 + \tan^2 x}$$

$$\sin x = \frac{2 \tan \frac{x}{2}}{1 + \tan^2 \frac{x}{2}}$$

$$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}$$

$$\cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2}$$

$$\sin 2x = 2 \sin x \cos x$$

$$\cos 2x = \cos^2 x - \sin^2 x$$

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

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

$$\cos^2 x = \frac{1}{1 + \tan^2 x}$$

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

$$\sin x - \sin y = 2 \cos \frac{x+y}{2} \sin \frac{x-y}{2}$$

$$\cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2}$$

Funciones hiperbólicas

$$\sinh x = \frac{e^x - e^{-x}}{2}$$

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

$$\sinh(x + y) = \sinh x \cosh y + \cosh x \sinh y$$

$$\cosh(x + y) = \cosh x \cosh y + \sinh x \sinh y$$

$$\tanh(x + y) = \frac{\tanh x + \tanh y}{1 + \tanh x \tanh y}$$

$$\sinh^2 x = \frac{\cosh 2x - 1}{2}$$

$$\arg \sinh x = \ln(x + \sqrt{x^2 + 1})$$

$$\arg \cosh x = \ln(x + \sqrt{x^2 - 1})$$

$$\arg \tanh x = \ln \sqrt{\frac{1+x}{1-x}}$$

$$\cosh x = \frac{e^x + e^{-x}}{2}$$

$$\cosh^2 x - \sinh^2 x = 1$$

$$\sinh 2x = 2 \sinh x \cosh x$$

$$\cosh 2x = \cosh^2 x + \sinh^2 x$$

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

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

Algunas propiedades de los logaritmos

$$\log_a xy = \log_a x + \log_a y$$

$$\log_a x^n = n \log_a x$$

$$\log_a \frac{x}{y} = \log_a x - \log_a y$$