

Notas.

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### IDENTIDADES TRIGONOMÉTRICAS.

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

2.  $\sec^2 x = 1 + \tan^2 x$

3.  $\csc^2 x = 1 + \cot^2 x$

4.  $\sin 2x = 2 \sin x \cos x$

5.  $\cos 2x = \cos^2 x - \sin^2 x = 1 - 2 \sin^2 x = 2 \cos^2 x - 1$

6.  $\sin^2 x = \frac{1}{2}(1 - \cos 2x)$

7.  $\cos^2 x = \frac{1}{2}(1 + \cos 2x)$

8.  $\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$

9.  $\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$

10.  $\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}$

11.  $\tan x = \frac{\sin x}{\cos x}$

12.  $\cot x = \frac{\cos x}{\sin x}$

13.  $\sec x = \frac{1}{\cos x}$

14.  $\csc x = \frac{1}{\sin x}$

15.  $\sin\left(\frac{x}{2}\right) = \pm \left(\frac{1 - \cos x}{2}\right)^{1/2}$

16.  $\cos\left(\frac{x}{2}\right) = \pm \left(\frac{1 + \cos x}{2}\right)^{1/2}$

17.  $\tan\left(\frac{x}{2}\right) = \frac{\sin x}{1 + \cos x} = \frac{1 - \cos x}{\sin x}$

$$18. \cot\left(\frac{x}{2}\right) = \frac{1 + \cos x}{\sin x} = \frac{\sin x}{1 - \cos x}$$

$$19. \sin x = 2 \sin\left(\frac{x}{2}\right) \cos\left(\frac{x}{2}\right)$$

$$20. \cos x = \cos^2\left(\frac{x}{2}\right) - \sin^2\left(\frac{x}{2}\right)$$

$$21. \arcsin x + \arccos x = \frac{\pi}{2}$$

$$22. \arctan x + \operatorname{arccot} x = \frac{\pi}{2}$$

LOGARITMOS Y EXPONENCIALES (Relaciones funcionales básicas).

$$1. y = \lg_a x \text{ si y sólo si } a^y = x$$

$$2. \lg_a 1 = 0$$

$$3. \lg_a a = 1$$

$$4. \lg_a (x \cdot y) = \lg_a x + \lg_a y$$

$$5. \lg_a \left(\frac{x}{y}\right) = \lg_a x - \lg_a y$$

$$6. \lg_a (x^z) = z \lg_a x$$

$$7. a^{\lg_a x} = x$$

$$8. b^x = a^{x \lg_a b}$$

$$9. y = \ln x \text{ si y sólo si } e^y = x, \quad (e \approx 2,71828)$$

$$10. \lg_a x = \frac{\lg_b x}{\lg_b a}$$

IDENTIDADES HIPERBÓLICAS

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

$$2. \operatorname{sech}^2 x = 1 - \tanh^2 x$$

$$3. \operatorname{csch}^2 x = \operatorname{coth}^2 x - 1$$

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4.  $\sinh 2x = 2 \sinh x \cosh x$

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

#### ALGUNOS PRODUCTOS NOTABLES

1.  $(a \pm b)^2 = a^2 \pm 2ab + b^2$

2.  $(a \pm b)^3 = a^3 \pm 3a^2b + 3ab^2 \pm b^3$

3.  $(a \pm b)^4 = a^4 \pm 4a^3b + 6a^2b^2 \pm 4ab^3 + b^4$

4.  $(a \pm b)^5 = a^5 \pm 5a^4b + 10a^3b^2 \pm 10a^2b^3 + 5ab^4 \pm b^5$

5.  $(a + b)(a - b) = a^2 - b^2$

6.  $(a \pm b)(a^2 \mp ab + b^2) = a^3 \pm b^3$

7.  $(\sqrt[3]{x} - \sqrt[3]{y})(\sqrt[3]{x^2} + \sqrt[3]{xy} + \sqrt[3]{y^2}) = x - y$

8.  $(x^{\frac{1}{n}} - y^{\frac{1}{m}})(x^{\frac{k-1}{n}} + x^{\frac{k-2}{n}}y^{\frac{1}{m}} + x^{\frac{k-3}{n}}y^{\frac{2}{m}} + \dots + y^{\frac{k-1}{m}}) = x^{\frac{k}{n}} - y^{\frac{k}{m}}$

9. Continuará