Taller de identidades trigonométricas

Resumen

Resolver el taller propuesto, demostrando justificadamente (con sus pasos y por escrito) cada identidad.

1. Por similitud

1. $\cot^2 \phi + \frac{1}{\tan \phi \cot \phi} = \operatorname{cosec}^2 \phi$

2. $\operatorname{sen}^2 \phi + \cot^2 \phi + \cos^2 \phi = \operatorname{cosec}^2 \phi$

3. $\cos^2 \phi \tan^2 \phi = 1 - \cos^2 \phi$

4. $\cot^2 \phi (\sec^2 \phi - 1) = 1$

2. Por conversión a sen y cos

1. $\operatorname{cosec} \mu \cos \mu = \cot \mu$

2. $\tan^2 \mu \cos^2 \mu + \cos^2 \mu = \frac{1}{\operatorname{cosec}^2 \mu} + \frac{1}{\sec^2 \mu}$

3. $\sec \mu + \operatorname{cosec} \mu = \sec \mu \operatorname{cosec} \mu (\operatorname{sen} \mu + \cos \mu)$

4. $\tan^2 \mu + \operatorname{cosec} \mu \operatorname{sen} \mu = \frac{\sec \mu}{\cos \mu}$

3. Usando tablas

1. $\operatorname{sen}(x + y) - \operatorname{sen}(x - y) = 2 \cos x \operatorname{sen} y$

2. $\frac{\operatorname{sen}(x-y)}{\operatorname{sen} x \operatorname{sen} y} = \cot y - \cot x$

3. $\cos^2 \sigma \cot^2 \sigma = \cot^2 \sigma - \cos^2 \sigma$

4. $\frac{1 - \cos \sigma}{1 + \cos \sigma} = \frac{\sec \sigma - 1}{\sec \sigma + 1}$

5. $\frac{\sin(2\sigma)}{\cos(2\sigma) + 1} = \tan \sigma$

4. Realizando operaciones

1. $2 \tan \psi = \frac{1}{\sec \psi - \tan \psi} - \frac{1}{\sec \psi + \tan \psi}$

2. $(\operatorname{sen} \psi + \cos \psi)^2 = 1 + \operatorname{sen}(2\psi)$

3. $\operatorname{sen}(\psi + 45°) = \frac{\sqrt{2}}{2}(\operatorname{sen} \psi + \cos \psi)$

4. $(\operatorname{sen} \frac{\psi}{2} + \cos \frac{\psi}{2})^2 = 1 + \operatorname{sen} \psi$

5. Usando factorización

1. $\operatorname{sen}^4 \nu - \cos^4 \nu = \operatorname{sen}^2 \nu - \cos^2 \nu$

2. $\frac{\sin^2 \nu + 2 \cos \nu - 1}{2 + \cos \nu - \cos^2 \nu} = \frac{1}{1 + \sec \nu}$

3. $\frac{\tan^3 \nu + 1}{\tan \nu + 1} = \sec^2 \nu - tan\nu$; usar $a^3 + 1 = (a + 1)(1 - a + a^2)$.

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