Simplificación de Expresiones y Verificación de Identidades

Simplifica las siguientes expresiones:

1. $\dfrac{1}{1-\cos\varphi}+\dfrac{1}{1+\cos\varphi}=$

2. $\dfrac{(1-\cos\theta)^2+\operatorname{sen}^2\theta}{1-\cos\theta}=$

3. $\dfrac{\cos^2\omega-(\operatorname{sen}\omega+1)^2}{\operatorname{sen}\omega+1}=$

4. $\operatorname{sen}\rho\csc\rho+\dfrac{\operatorname{sen}\rho}{\cot\rho\cos\rho}=$

5. $\operatorname{sen}\rho\csc\rho-\dfrac{\operatorname{sen}\rho}{\cot\rho\cos\rho}=$

6. $\dfrac{\cos\alpha\tan\alpha+\operatorname{sen}\alpha}{\tan\alpha}=$

7. $\dfrac{\tan\theta-\cot\theta}{\tan\theta+\cot\theta}=$

8. $\dfrac{\csc^2\sigma-1}{\cot\sigma}=$

9. $\dfrac{\sec^2\beta-1}{\tan\beta}=$

10. $\sec\omega\csc\omega-\sec\omega\operatorname{sen}\omega=$

11.

Verifica las siguientes identidades:

1. $\dfrac{3\cos^2\kappa + 5\operatorname{sen}\kappa - 5}{\cos^2\kappa} = \dfrac{3\operatorname{sen}\kappa - 2}{1+\operatorname{sen}\kappa}$

2. $\dfrac{2\cos^2\alpha - \operatorname{sen}^2\alpha + 1}{\cos\alpha} = 3\cos\alpha$

3. $\dfrac{2\operatorname{sen}^2\theta + 3\cos\theta - 3}{\operatorname{sen}^2\theta} = \dfrac{2\cos\theta - 1}{1+\cos\theta}$

4. $\dfrac{1+\cos\vartheta}{\operatorname{sen}\vartheta} + \dfrac{\operatorname{sen}\vartheta}{1+\cos\vartheta} = 2\csc\vartheta$

5. $\dfrac{1-\csc\beta}{1+\csc\beta} = \dfrac{\operatorname{sen}\beta - 1}{\operatorname{sen}\beta + 1}$

6. $\dfrac{1-\cos\beta}{1+\cos\beta} = \dfrac{\sec\beta - 1}{\sec\beta + 1}$

7. $\dfrac{2-\cos^2\rho}{\operatorname{sen}\rho} = \csc\rho + \operatorname{sen}\rho$

8. $\dfrac{2-\operatorname{sen}^2\rho}{\cos\rho} = \sec\rho + \cos\rho$

9. $\dfrac{\tan\theta}{\operatorname{sen}\theta + 2\tan\theta} = \dfrac{1}{\cos\theta + 2}$

10. $\dfrac{\cos\beta}{1-\operatorname{sen}\beta} + \dfrac{\cos\beta}{1+\operatorname{sen}\beta} = 2\sec\beta$