

IDENTIDADES TRIGONOMÉTRICAS

. Simplificar:

a) $\frac{\sin 4\alpha + \sin 2\alpha}{\cos 4\alpha + \cos 2\alpha} =$

(Soluc: $\operatorname{tg} 3\alpha$)

b) $\frac{\sin 2\alpha}{1 - \cos^2 \alpha} =$

(Soluc: $2 \operatorname{ctg} \alpha$)

c) $\frac{2 \cos (45^\circ + \alpha) \cos (45^\circ - \alpha)}{\cos 2\alpha} =$

(Soluc: 1)

d) $2 \operatorname{tg} x \cos^2 \frac{x}{2} - \sin x =$

(Soluc: $\operatorname{tg} x$)

e) $2 \operatorname{tg} \alpha \sin^2 \frac{\alpha}{2} + \sin \alpha =$

(Soluc: $\operatorname{tg} \alpha$)

f) $\frac{\cos(a+b) + \cos(a-b)}{\sin(a+b) + \sin(a-b)} =$

(Soluc: $\operatorname{ctg} a$)

. Demostrar las siguientes identidades:

a) $\frac{1 - \cos 2\alpha}{\sin^2 \alpha + \cos 2\alpha} = 2 \operatorname{tg}^2 \alpha$

b) $\sin 2\alpha \cos \alpha - \sin \alpha \cos 2\alpha = \sin \alpha$

c) $\cos \alpha \cos (\alpha - \beta) + \sin \alpha \sin (\alpha - \beta) = \cos \beta$

d) $\sin \alpha + \cos \alpha = \sqrt{2} \cos \left(\frac{\pi}{4} - \alpha \right)$

e) $\frac{2 \sin \alpha - \sin 2\alpha}{2 \sin \alpha + \sin 2\alpha} = \frac{1 - \cos \alpha}{1 + \cos \alpha} = \operatorname{tg}^2 \frac{\alpha}{2}$

f) $\sin^2 \frac{\alpha + \beta}{2} - \sin^2 \frac{\alpha - \beta}{2} = \sin \alpha \sin \beta$