Giải bài 7 trang 156 sgk toán Đại Số lớp 10

Đề bài:

Chứng minh các đồng nhất thức

a) $\frac{1-\cos x+\cos 2x}{\sin 2x-\sin x}=\cot x$

b) $\frac{\sin x+\sin\frac{x}{2}}{1+\cos x+\cos\frac{x}{2}}=\tan\frac{x}{2}$

c) $\frac{2\cos 2x-\sin 4x}{2\cos 2x+\sin 4x}=\tan^2(\frac{\pi}{4}-x)$

d) $\tan x-\tan y=\frac{\sin(x-y)}{\cos x.\cos y}$

Đáp án:

$a)\ \frac{1-\cos x+\cos 2x}{\sin 2x-\sin x}=\frac{1+\cos 2x-\cos x}{2\sin x\cos x-\sin x}=\frac{\cos x(2\cos x-1)}{\sin x(2\cos x-1)}=\cot x$

$b)\ \frac{\sin x+\sin\frac{x}{2}}{1+\cos x+\cos\frac{x}{2}}$

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

$=\frac{\sin\frac{x}{2}(2\cos\frac{x}{2}+1)}{\cos\frac{x}{2}(2\cos\frac{x}{2}+1)}$

$=\tan\frac{x}{2}.$

$c)\ \frac{2\cos 2x-\sin 4x}{2\cos 2x+\sin 4x}$

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

$=\frac{1-\sin 2x}{1+\sin 2x}$

$=\frac{1-\cos(\frac{\pi}{2}-2x)}{1+\cos(\frac{\pi}{2}-2x)}$

$=\frac{2\sin^2(\frac{\pi}{4}-x)}{2\cos^2(\frac{\pi}{4}-x)}$

$=\tan^2(\frac{\pi}{4}-x)$

$d)\ \tan x-\tan y$

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

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

$=\frac{\sin(x-y)}{\cos x\cos y}.$