# *Giải bài 9 trang 161 sgk toán Đại Số lớp 10*

**Đề bài:**

Tính giá trị biểu thức

a) $4(cos24^0 + \cos 48^0 - \cos 84^0 - \cos 12^0)$

b) $96\sqrt{3}\sin\frac{\pi}{48}\cos\frac{\pi}{48}\cos\frac{\pi}{24}\cos\frac{\pi}{12}\cos\frac{\pi}{6}$

c) $\tan 9^0 - \tan 63^0 + \tan 81^0 - \tan 27^0$

**Đáp án:**

$$cos24^0 + \cos 48^0$$
$$= \cos(36^0 - 12^0) + \cos(36^0 + 12^0)$$
$$= 2\cos 36^0 \cos 12^0$$
$$\cos 84^0 + \cos 12^0 = 2\cos 36^0 \cos 48^0$$
$$4(\cos 24^0 + \cos 48^0 - \cos 84^0 - \cos 12^0)$$
$$= 8\cos 36^0(\cos 12^0 - \cos 48^0)$$
$$= 8\cos 36^0.2\sin 30^0.\sin 18^0$$
$$= 8\cos 36^0 \sin 18^0$$
$$= 8\cos 36^0.\sqrt{\frac{1-\cos 36^0}{2}}$$

Đặt $36^0 = x$ ta có:

$$sin3x = sin\left(180^0 - 3x\right) = sin2x$$
$$\Leftrightarrow 3\sin x - 4\sin^3 x = 2\sin x \cos x$$
$$\Leftrightarrow 3 - 4(1 - \cos^2 x) = 2\cos x$$
$$\Leftrightarrow 4cos^2 x - 2\cos x - 1 = 0$$
$$\Rightarrow \cos x = \cos 36^0 = \frac{1+\sqrt{5}}{4}$$

Vậy : $4(cos24^0 + \cos 48^0 - \cos 84^0 - \cos 12^0) = 2(1+\sqrt{5})\sqrt{\frac{3-\sqrt{5}}{8}} = 2$

$$b)\ 96\sqrt{3}\sin\frac{\pi}{48}\cos\frac{\pi}{48}\cos\frac{\pi}{24}\cos\frac{\pi}{12}\cos\frac{\pi}{6}$$
$$= 48\sqrt{3}\sin\frac{\pi}{24}\cos\frac{\pi}{24}\cos\frac{\pi}{12}\cos\frac{\pi}{6}$$
$$= 24\sqrt{3}\sin\frac{\pi}{12}\cos\frac{\pi}{12}\cos\frac{\pi}{6}$$
$$= 12\sqrt{3}\sin\frac{\pi}{6}\cos\frac{\pi}{6} = 6\sqrt{3}\sin\frac{\pi}{3} = 9$$

$$c)\ \tan 9^0 - \tan 63^0 + \tan 81^0 - \tan 27^0$$
$$= \frac{\cos 81^0}{\sin 81^0} + \frac{\sin 81^0}{\cos 81^0} - \left(\frac{\cos 27^0}{\sin 27^0} + \frac{\sin 27^0}{\cos 27^0}\right)$$
$$= \frac{1}{\sin 81^0 . cos81^0} - \frac{1}{\sin 27^0 . cos27^0}$$
$$= \frac{2}{\sin 18^0} - \frac{2}{\sin 54^0} = \frac{2}{\cos 72^0} - \frac{2}{\cos 36^0}$$
$$= \frac{2}{2\cos^2 36^0 - 1} - \frac{2}{\cos 36^0}$$

Thay $\cos 36^0 = \frac{1+\sqrt{5}}{4}$ ta được: $\tan 9^0 - \tan 63^0 + \tan 81^0 - \tan 27^0 = 4$