Exercices de trigonométrie

1. Simplifiez:

a). $\frac{\sin(\pi - x)}{\cos(\frac{\pi}{2} + x)} + \frac{\sin(\frac{\pi}{2} + x)}{\cos(2\pi - x)}$

b). $\cos x + \cos(x + \frac{2\pi}{3}) + \cos(x + \frac{4\pi}{3})$

c). $\sin^4 x + \cos^4 x + 2 \cdot (1 + \sin^2 x \cos^2 x)$

2. Vérifiez les identités suivantes:

a). $\cos x \ (1 + \cot gx) + \sin x \ (1 + tgx) = \frac{\cos x + \sin x}{\cos x \sin x}$

b). $2 + tg^2 x + \cot g^2 x = \frac{4}{\sin^2 2x}$

c). $2\sin(a - b)\cos(a + b) = \sin 2a - \sin 2b$

d). $\cos(a - b)\cos(a + b) = \cos^2 a - \sin^2 b$

e). $\cos(a + b)\cos(a - b) - \sin(a + b)\sin(a - b) = \cos 2a$

f). $tga + \cot ga = 2\cos éc2a$

g). $\frac{\cos a}{1 + \cos 2a} \cdot \frac{\sin 2a}{1 + \cos a} = \cot g(\frac{\pi}{2} - \frac{a}{2})$

3. Factorisez:

a). $\sin a + \sin 5a + \sin 6a$

b). $\sin a + \sin 5a + 2\sin 3a$

c). $\cos a + \cos 2a + \cos 3a + \cos 4a$

4. Sachant que a, b et c sont les angles d'un triangle, vérifiez que:

a). $\sin b \cos c + \cos b \sin c = \sin a$

b). $\sin a + \sin b + \sin c = 4\cos\frac{a}{2}\cos\frac{b}{2}\cos\frac{c}{2}$

c). $\cos a + \cos b + \cos c = 4\sin\frac{a}{2}\sin\frac{b}{2}\sin\frac{c}{2} + 1$

d). $tg\frac{a}{2}tg\frac{b}{2} + tg\frac{b}{2}tg\frac{c}{2} + tg\frac{c}{2}tg\frac{a}{2} = 1$