

Trigonométrie des familles

1) ARCS ASSOCIÉS : simplifier :

$$A = \sin(\alpha + \pi) + \cos(\pi - \alpha) - \sin(\alpha - 2\pi) + \cos(\alpha + 5\pi)$$

$$B = \frac{\sin(x + \pi/2) + \sin(x + \pi) + \sin(x + 3\pi/2)}{\cos(\frac{\pi}{2} - x) + \cos(\pi - x) + \cos(\frac{3\pi}{2} - x)}$$

2) EQUATIONS : $\sin x = \cos k\pi$; $2 \cos x + \sqrt{3} = 0$; $2 \cos 2x = -1$
 $\sin 2x = \cos 3x$; $\cos 3x = \cos \frac{\pi}{4}$; $\cos \frac{x}{3} + \sin \frac{x}{2} = 0$; $\cos 2x + \cos x = 0$
 $\operatorname{tg} x = \sqrt{3}$; $\operatorname{tg} \frac{x}{2} = \operatorname{tg} \frac{\pi}{4}$; $4 \cos^2 x + 4 \cos x - 3 = 0$; $\cos^2 x = 2 \sin x$

3) FORMULES D'ADDITIONS ET DE MULTIPLICATIONS :

Réduire : $\cos 4x \cdot \cos 2x - \sin 4x \cdot \sin 2x$; $\sin 5x \cdot \cos 7x - \sin 7x \cdot \cos 5x$

$$\frac{\sin 2x}{\sin x} - \frac{\cos 2x}{\cos x} ; \frac{\sin 2x + \cos 2x}{\cos x \sin x} ; \frac{\sin 3x + \cos 3x}{\cos x \sin x}$$

$$\frac{1 + \cos 2x}{1 - \cos 2x} ; \frac{1 - \cos x}{1 + \cos x} ; \frac{1 - \sin x}{1 + \sin x} ; \frac{2 + \sin 2x - 2 \cos 2x}{1 + 2 \sin 2x - \cos 2x} ;$$

$$\frac{1 + \cos x - \sin x}{1 - \cos x - \sin x}$$

4) EXPRIMER EN FONCTION DE COS 2X

$$\cos^2 x + 2 \sin^2 x ; 3 \cos^2 x - 2 \sin^2 x ; \cos^4 x - \sin^4 x$$

5) EXPRIMER EN FONCTION DE tg x/2 :

$$\frac{1 - \cos x}{\sin x} ; \frac{\sin x}{1 + \cos x} ; \frac{\sin x + \cos x - 1}{3 \sin x - 2 \cos x + 2}$$

6) ETABLIR LES EGALITES :

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

$$\cos a \cdot \sin(b - c) + \cos b \cdot \sin(c - a) + \cos c \cdot \sin(a - b) = 0$$

7) RESOUDRE :

$$\frac{1 - \cos 2x}{1 + \cos x} = 1 ; 2 \sin x \cos x + \sqrt{3} \cos 2x = 0 ; \frac{\cos x}{\cos a} + \frac{\sin x}{\sin a} = 2$$

$$\sin x - \sqrt{3} \cos x = 1 ; \cos x + \sin x + 1 = 0 ; \cos 2x - \sqrt{3} \sin 2x = 1$$

(1)

8) TRANSFORMATION $\xrightarrow{\text{somme}}$ $\xrightarrow{\text{produit}}$; réduire : $\sin a + \sin b + \sin c - \sin(a + b + c)$

(1) simplifier $\frac{\sin a + \sin 3a + \sin 5a}{\cos a + \cos 3a + \cos 5a}$ Résoudre $\sin 2x + \sin 4x + \sin 6x + \sin 8x = 0$
(Factoriser) $\cos x + 2 \cos 2x + \cos 3x = 0$

(2) Linéariser : $\sin^3 x$; $\cos^3 x$; $\cos x \cos 3x \cos 5x$; $\cos^3 x \cdot \sin x$; $\sin^5 x$,

Simplifier : $\frac{\cos a - \cos b}{\cos a + \cos b}$; $\frac{\cos 2a - \cos a}{\sin 2a}$;

Résoudre : $\cos 5x - \cos x = \sin 3x$
 $\sin x - \sin 3x = \sin 2x$