## Formules

ACQUIS

$$\cos(x+y) = \cos x \cos y - \sin x \sin y$$

$$\sin(x+y) = \sin x \cos y + \cos x \sin y$$

$$\cos^2 x + \sin^2 x = 1 \quad \Leftrightarrow \quad (\cos x)^2 + (\sin x)^2 = 1$$

$$\tan x = \frac{\sin x}{\cos x} \qquad \sin^2 x = 1 - \cos^2 x$$

## Exemple : $\cos(3x) = f(\cos x)$

$$\cos(2x) = \cos(x+x) = \cos x \cos x - \sin x \sin x$$

$$= \cos^2 x - \sin^2 x = \cos^2 x - (1 - \cos^2 x)$$

$$= 2\cos^2 x - 1$$

$$\boxed{\cos(2x) = 2\cos^2 x - 1}$$

$$\cos(3x) = \cos(2x + x) = \cos 2x \cos x - \sin 2x \sin x$$

$$= 2\cos^3 x - \cos x$$

$$\sin 2x = \sin x \cos x + \cos x \sin x = \boxed{2 \sin x \cos x}$$

$$\boxed{\cos(3x)} = (2\cos^2 x - 1)\cos x - 2\sin x \cos x \sin x$$

$$= 2\cos^3 x - \cos x - 2\cos x \sin^2 x$$

$$= 2\cos^3 x - \cos x - 2\cos x (1 - \cos^2 x)$$

$$= 2\cos^3 x - \cos x - 2\cos x + 2\cos^3 x$$

$$= \boxed{4\cos^3 x - 3\cos x}$$

$$3\cos x + 2\sin x = -3$$

$$\sqrt{1-\cos^2 x} = \sin x = \frac{-3-3\cos x}{2} = -\frac{3+3\cos x}{2}$$

$$\cos^2 x + \sin^2 x = 1$$

$$\boxed{\cos^2 x + \left(\frac{3+3\cos x}{2}\right)^2 = 1}$$

$$(A+B)^2 = A^2 + 2AB + B^2$$

$$(A-B)^2 = A^2 - 2AB + B^2$$

$$\cos^2 x + \frac{1}{4}\left(9 + 18\cos x + 9\cos^2 x\right) = 1$$

$$\Leftrightarrow \quad 4\cos^2 x + 9 + 18\cos x + 9\cos^2 x = 4$$

$$\Leftrightarrow \quad 13\cos^2 x + 18\cos x + 5 = 0$$

$$\Leftrightarrow \quad 13t^2 + 18t + 5 = 0 \qquad t = \cos x$$

$$t = \frac{-18 \pm \sqrt{324-260}}{26} = \frac{-18 \pm 8}{26} = \begin{cases} -26/26 = -1 \\ -10/26 \end{cases}$$