

## FORMULAIRE DE TRIGONOMETRIE

### Formules d'addition

$$\begin{array}{ll} \cos(a+b) = \cos a \cos b - \sin a \sin b & \sin(a+b) = \sin a \cos b + \cos a \sin b \\ \cos(a-b) = \cos a \cos b + \sin a \sin b & \sin(a-b) = \sin a \cos b - \cos a \sin b \end{array}$$

$$\tan(a+b) = \frac{\tan a + \tan b}{1 - \tan a \tan b} \quad \text{si } a, b \text{ et } a+b \text{ sont différents de } \frac{\pi}{2} + k\pi \quad (k \in \mathbb{Z})$$

$$\tan(a-b) = \frac{\tan a - \tan b}{1 + \tan a \tan b} \quad \text{si } a, b \text{ et } a-b \text{ sont différents de } \frac{\pi}{2} + k\pi \quad (k \in \mathbb{Z})$$

### Formules de duplication

$$\begin{array}{ll} \cos 2a = \cos^2 a - \sin^2 a & \sin 2a = 2 \sin a \cos a \\ \cos^2 a = \frac{1 + \cos 2a}{2} & \sin^2 a = \frac{1 - \cos 2a}{2} \end{array}$$

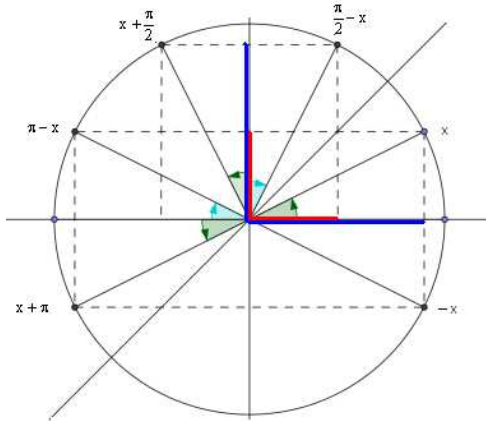
### Transformation de produits en sommes

$$\begin{array}{l} \cos a \cos b = \frac{\cos(a+b) + \cos(a-b)}{2} \\ \sin a \sin b = \frac{\cos(a-b) - \cos(a+b)}{2} \\ \sin a \cos b = \frac{\sin(a+b) + \sin(a-b)}{2} \end{array}$$

### Transformation de sommes en produits

$$\begin{array}{ll} \cos a + \cos b = 2 \cos\left(\frac{a+b}{2}\right) \cos\left(\frac{a-b}{2}\right) & \cos a - \cos b = -2 \sin\left(\frac{a+b}{2}\right) \sin\left(\frac{a-b}{2}\right) \\ \sin a + \sin b = 2 \sin\left(\frac{a+b}{2}\right) \cos\left(\frac{a-b}{2}\right) & \sin a - \sin b = 2 \sin\left(\frac{a-b}{2}\right) \cos\left(\frac{a+b}{2}\right) \end{array}$$

## Liens entre sinus et cosinus



$$\cos(-x) = \cos(x), \quad \sin(-x) = -\sin(x)$$

$$\cos\left(x + \frac{\pi}{2}\right) = -\sin(x), \quad \sin\left(x + \frac{\pi}{2}\right) = \cos(x)$$

$$\cos\left(\frac{\pi}{2} - x\right) = \sin(x), \quad \sin\left(\frac{\pi}{2} - x\right) = \cos(x)$$

$$\cos(x + \pi) = -\cos(x), \quad \sin(x + \pi) = -\sin(x)$$

$$\cos(\pi - x) = -\cos(x), \quad \sin(\pi - x) = \sin(x)$$