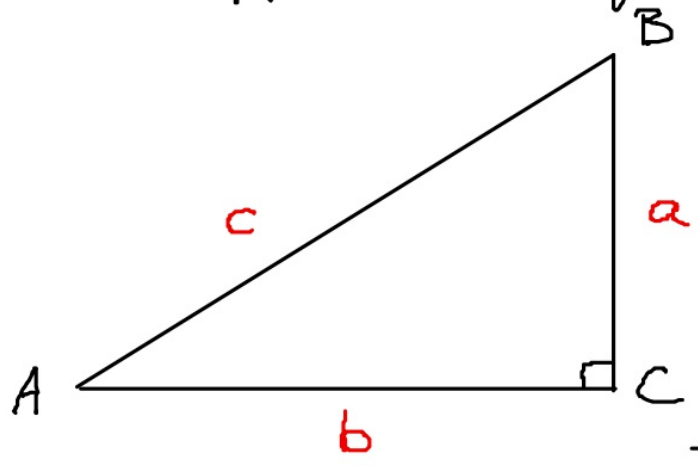


# ETAPE III

## REFLEXION 7: Les fonctions Trigonometriques

### Sujet 1: Des rapports aux fonctions Trigonometriques

#### Les rapports trigo dans le triangle rectangle



$$\sin A = \frac{\text{opp}}{\text{hyp}} = \frac{a}{c} = \cos B$$

$$\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{b}{c} = \sin B$$

$$\tan A = \frac{\text{opp}}{\text{adj}} = \frac{a}{b}$$

$$\sin A = \cos(90^\circ - A)$$

$$\cos A = \sin(90^\circ - A)$$

→ On considère aussi l'inverse de ces rapports

$$\text{Cosécante: } \operatorname{Cosec} A = \frac{1}{\sin A} = \frac{1}{\frac{a}{c}} = \frac{c}{a}$$

$$\text{Sécante: } \operatorname{Sec} A = \frac{1}{\cos A} = \frac{c}{b}$$

$$\text{Cotangente: } \operatorname{Cot} A = \frac{1}{\tan A} = \frac{b}{a} = \frac{\sin A}{\cos A}$$

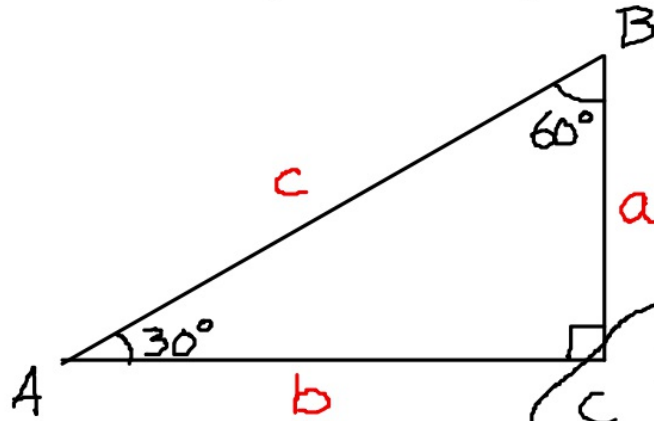
Exercice: Démontrer que  $\cot A = \frac{\operatorname{cosec} A}{\sec A}$

$$\begin{aligned}\cot A &= \frac{\operatorname{cosec} A}{\sec A} = \frac{\frac{1}{\sin A}}{\frac{1}{\cos A}} = \frac{\frac{1}{\frac{\text{opp}}{\text{hyp}}}}{\frac{1}{\frac{\text{adj}}{\text{hyp}}}} = \frac{\frac{\text{hyp}}{\text{opp}}}{\frac{\text{hyp}}{\text{adj}}} = \frac{\text{hyp}}{\text{opp}} \cdot \frac{\text{adj}}{\text{hyp}} \\ &= \frac{\text{adj}}{\text{opp}} = \cot A\end{aligned}$$

C. Q. F. D.



# 1.2 Angles Trigonométriques ~~\*\*\*\*\*~~



Valeur de  $\sin 30^\circ$ ,  $\sin 60^\circ$  et  $\sin 45^\circ$

$$a = \frac{c}{2}$$

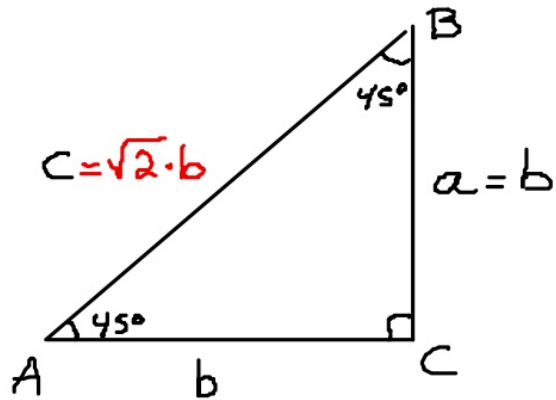
$$b = \sqrt{c^2 - a^2}$$

$$1 - \frac{1}{4} = \frac{4c^2}{4}$$

$$1) \sin 30^\circ = \cos 60^\circ = \frac{a}{c} = \frac{\frac{c}{2}}{c} = \frac{c}{2} \cdot \frac{1}{c} = \frac{1}{2}$$

$$2) \sin 60^\circ = \cos 30^\circ = \frac{b}{c} = \frac{\sqrt{c^2 - a^2}}{c} = \frac{\sqrt{c^2 - \left(\frac{c}{2}\right)^2}}{c} = \frac{\sqrt{c^2 - \frac{c^2}{4}}}{c}$$

$$\begin{aligned} &= \frac{\sqrt{\frac{3c^2}{4}}}{c} \\ &= \frac{\sqrt{3} \cdot \sqrt{c^2}}{\sqrt{4}} \\ &= \frac{\sqrt{3} \cdot c}{2} \cdot \frac{1}{c} = \frac{\sqrt{3}}{2} \end{aligned}$$



Par pythagore :  $c = \sqrt{a^2 + b^2}$

$$c = \sqrt{b^2 + b^2}$$

$$c = \sqrt{2b^2}$$

$$c = \sqrt{2} \cdot \sqrt{b^2} = \sqrt{2} \cdot b$$

$$3) \sin 45^\circ = \cos 45^\circ = \frac{b}{\sqrt{2} \cdot b} = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \boxed{\frac{\sqrt{2}}{2}}$$