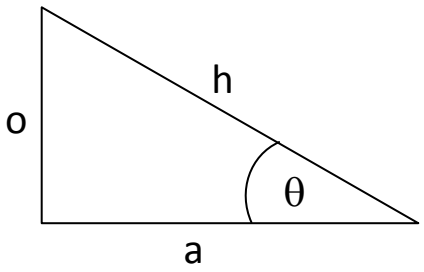
Maths Crib Sheet 1 – Pythagoras, Trig, Radians, Rotation and Translation



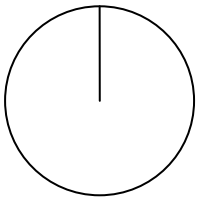
$$h^2 = o^2 + a^2$$

$$\sin\theta = \frac{o}{h}$$

$$\cos\theta = \frac{a}{h}$$

$$\tan\theta = \frac{o}{a}$$

$$2\pi\ Radians = 360°$$



$$1° = \frac{2\pi\ radians}{360°} = \frac{\pi\ radians}{180°}$$

$$deg2rad(d) = d\left(\frac{\pi\ radians}{180°}\right)$$

$$rad2\deg(r) = r\left(\frac{180°}{\pi\ radians}\right)$$

Clockwise Rotation

$$\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} x \\ y \end{bmatrix} \begin{bmatrix} cos\theta & sin\theta \\ -sin\theta & cos\theta \end{bmatrix}$$

Counter Clockwise Rotation

$$\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} x \\ y \end{bmatrix} \begin{bmatrix} cos\theta & -sin\theta \\ sin\theta & cos\theta \end{bmatrix}$$

Remember:

$$\begin{bmatrix} a & c \\ b & d \end{bmatrix} X \begin{bmatrix} p \\ q \end{bmatrix} = \begin{bmatrix} ap + cq \\ bp + dq \end{bmatrix}$$

Translation

$$\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} x + dx \\ y + dy \end{bmatrix}$$