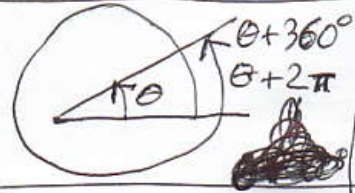
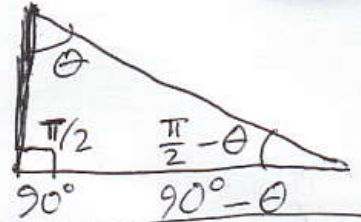


Four Trig symmetries to memorize:

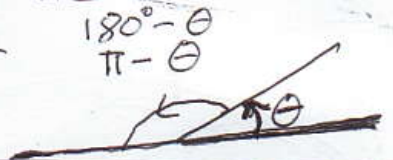
$$\textcircled{1} \left. \begin{aligned} \cos(\theta + 2\pi) &= \cos \theta \\ \sin(\theta + 2\pi) &= \sin \theta \end{aligned} \right\} \text{Periodicity}$$



$$\textcircled{2} \left. \begin{aligned} \cos\left(\frac{\pi}{2} - \theta\right) &= \sin \theta \\ \sin\left(\frac{\pi}{2} - \theta\right) &= \cos \theta \end{aligned} \right\} \text{Complementary angles}$$



$$\textcircled{3} \left. \begin{aligned} \cos(\pi - \theta) &= -\cos \theta \\ \sin(\pi - \theta) &= +\sin \theta \end{aligned} \right\} \text{Supplementary angles}$$

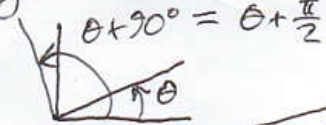


$$\textcircled{4} \left. \begin{aligned} \cos(-\theta) &= +\cos \theta \\ \sin(-\theta) &= -\sin \theta \end{aligned} \right\} \text{"Even/Odd" Symmetry}$$

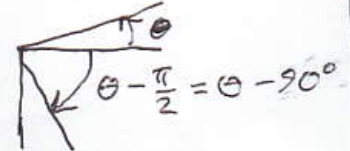


4 other useful trig symmetries:

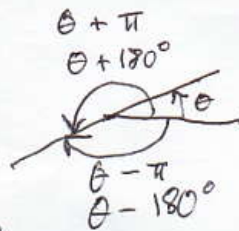
$$\left. \begin{aligned} \cos\left(\theta + \frac{\pi}{2}\right) &= -\sin \theta \\ \sin\left(\theta + \frac{\pi}{2}\right) &= \cos \theta \end{aligned} \right\} \text{Adding } 90^\circ$$



$$\left. \begin{aligned} \cos\left(\theta - \frac{\pi}{2}\right) &= \sin \theta \\ \sin\left(\theta - \frac{\pi}{2}\right) &= -\cos \theta \end{aligned} \right\} \text{Subtracting } 90^\circ$$



$$\left. \begin{aligned} \cos(\theta \pm \pi) &= -\cos \theta \\ \sin(\theta \pm \pi) &= -\sin \theta \end{aligned} \right\} \begin{array}{l} \text{Adding } 180^\circ \\ \text{Subtracting } 180^\circ \end{array}$$



$$\left. \begin{aligned} \cos\left(-\left(\frac{\pi}{2} + \theta\right)\right) &= -\sin \theta \\ \sin\left(-\left(\frac{\pi}{2} + \theta\right)\right) &= -\cos \theta \end{aligned} \right\} \begin{array}{l} \text{Adding } 90^\circ, \\ \text{reversing direction} \end{array}$$

