Notes Section 7.4: Basic Trig. Equations

An Identity is a trig. Equation that's true for every angle. Most trig Equations are only true for certain values of θ.

ex: $2\cos\theta - 1 = 0$

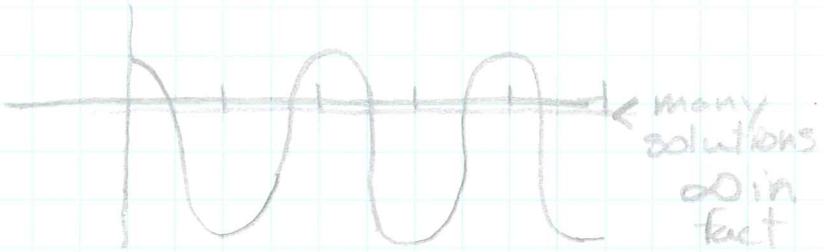
$\cos\theta = \frac{1}{2}$

1st quad. solutions

$\theta = 60^\circ + n360^\circ$

$\theta = -60^\circ$ or $+300^\circ + n360^\circ$

degrees



$\frac{\pi}{3} + 2k\pi$; $\frac{5\pi}{3} + 2k\pi$

radians

unknown values - use $\sin^{-1}, \cos^{-1}, \tan^{-1}$

ex: $\tan\theta = 1.78$ ← ok for tan, not for sin/cos.

$\tan^{-1}(1.78) = \theta = 60.67^\circ$; 240.67°

$= 1.059$ radians

unlike sin/cos, tan has same signs directly across. therefore can get both tan value w/ 1 expression

so $\theta = 60.67^\circ + n180^\circ$

$\theta = 1.059 + k\pi$ radians

ex: $2\cos^2\theta - 1 = 0$

$\cos\theta = \pm\frac{1}{\sqrt{2}} = \pm\frac{\sqrt{2}}{2}$

$\frac{\pi}{4} + k\pi$, $\frac{3\pi}{4} + k\pi$ or $\frac{\pi}{4} + k\frac{\pi}{2}$

Factoring to solve:

$(\cos\theta - 2)(\cos\theta - 1)$

$\cos^2\theta - \cos\theta - 2 = 0$ → like: $x^2 - x -$

$(\cos\theta - 2)(\cos\theta + 1)$ ← $(x-2)(x-1)$

↑ ↑ solve each binomial for zero

$\cos\theta - 2 = 0$ $\quad \cos\theta + 1 = 0$

$\cos\theta = 2$ $\quad \cos\theta = -1$

impossible $\quad \theta = \pi + 2k\pi = \pi(1+2k)$

$180^\circ + n360^\circ$