TRIGONOMETRIC IDENTITIES (FOR MAC1114)

1)

Angle	0^0	$\frac{\pi}{6}=30^0$	$\frac{\pi}{4}=45^0$	$\frac{\pi}{3}=60^0$	$\frac{\pi}{2}=90^0$
Sin x	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
Cos x	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
Tan x	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	undef

2) a) sin (x + y) = sin x cos y + cos x sin y b) sin (x - y) = sin x cos y - cos x sin y

c) cos(x + y) = cos x cos y – sin x sin y d) cos(x – y) = cos x cos y + sin x sin y

3) a) $\sin x+\sin y=2\sin\frac{x+y}{2}\cos\frac{x-y}{2}$ b) $\sin x-\sin y=2\cos\frac{x+y}{2}\sin\frac{x-y}{2}$

c) $\cos x+\cos y=2\cos\frac{x+y}{2}\cos\frac{x-y}{2}$ d) $\cos x-\cos y=-2\sin\frac{x+y}{2}\sin\frac{x-y}{2}$

4) a) sin 2x = 2 sin x cos x b) $\cos 2x=\begin{cases}\cos^2 x-\sin^2 x\\ 1-2\sin^2 x\\ 2\cos^2 x-1\end{cases}$ c) $\tan 2x=\frac{2\tan x}{1-\tan^2 x}$

5) a) $\sin\frac{x}{2}=\pm\sqrt{\frac{1-\cos x}{2}}$ b) $\cos\frac{x}{2}=\pm\sqrt{\frac{1+\cos x}{2}}$

6) a) If $\sin x = \alpha$ then; $x = 2k\pi + sin^{-1}\alpha$ Where K is an integer
or $x = 2k\pi + (\pi - sin^{-1}\alpha)$

b) If $\cos x = \beta$ then; $x = 2k\pi \mp cos^{-1}\beta$ Where K is an integer

c) If $\tan x = \gamma$ then; $x = k\pi + tan^{-1}\gamma$ Where K is an integer