# Identities

1) $\sin(-x) = -\sin x$
2) $\cos(-x) = \cos x$
3) $\tan(-x) = -\tan x$

4) $\sin^2 x + \cos^2 x = 1$
5) $1 + \tan^2 x = \sec^2 x$
6) $1 + \cot^2 x = \csc^2 x$

7) $\sin(x+y) = \sin x \cos y + \cos x \sin y$
8) $\sin(x-y) = \sin x \cos y - \cos x \sin y$
9) $\cos(x+y) = \cos x \cos y - \sin x \sin y$
10) $\cos(x-y) = \cos x \cos y + \sin x \sin y$

11) $\sin x = \cos\left(\frac{\pi}{2} - x\right)$

12) $\cos x = \sin\left(\frac{\pi}{2} - x\right)$

13) $\sin 2x = 2 \sin x \cos x$

14) $\cos 2x = \cos^2 x - \sin^2 x$ ; $\cos 2x = 1 - 2\sin^2 x$ ; $\cos 2x = 2\cos^2 x - 1$

15) $\tan 2x = \frac{2 \tan x}{1 - \tan^2 x}$

16) $\sin \frac{x}{2} = \pm \sqrt{\frac{1 - \cos x}{2}}$

17) $\cos \frac{x}{2} = \pm \sqrt{\frac{1 + \cos x}{2}}$

18) $\tan \frac{x}{2} = \pm \sqrt{\frac{1 - \cos x}{1 + \cos x}}$

19) Law of cosines: $a^2 = b^2 + c^2 - 2bc \cos A$

20) Law of Sines: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

1) Note: The page of identities will be included on the Final Exam