

## Trigonometric Identities

MAC1114

*url: imathesis.com*

### Sum and difference formulas:

1.  $\sin(\alpha + \beta) = \sin(\alpha) \cos(\beta) + \sin(\beta) \cos(\alpha)$

3.  $\cos(\alpha + \beta) = \cos(\alpha) \cos(\beta) - \sin(\alpha) \sin(\beta)$

5.  $\tan(\alpha + \beta) = \frac{\tan(\alpha) + \tan(\beta)}{1 - \tan(\alpha) \tan(\beta)}$

2.  $\sin(\alpha - \beta) = \sin(\alpha) \cos(\beta) - \sin(\beta) \cos(\alpha)$ .

4.  $\cos(\alpha - \beta) = \cos(\alpha) \cos(\beta) + \sin(\alpha) \sin(\beta)$ .

6.  $\tan(\alpha - \beta) = \frac{\tan(\alpha) - \tan(\beta)}{1 + \tan(\alpha) \tan(\beta)}$

### Double angle formulas:

1.  $\sin(2\theta) = 2 \sin(\theta) \cos(\theta)$

2.  $\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta)$ .

3.  $\tan(2\theta) = \frac{2 \tan(\theta)}{1 - \tan^2(\theta)}$

4.  $\cos(2\theta) = 1 - 2 \sin^2(\theta)$  .

5.  $\cos(2\theta) = 2 \cos^2(\theta) - 1$

### Power reducing formulas:

1.  $\sin^2(\theta) = \frac{1 - \cos(2\theta)}{2}$ .

2.  $\cos^2(\theta) = \frac{1 + \cos(2\theta)}{2}$

3.  $\tan^2(\theta) = \frac{1 - \cos(2\theta)}{1 + \cos(2\theta)}$

### Half angle formulas:

1.  $\sin(\theta/2) = \sqrt{\frac{1 - \cos(\theta)}{2}}$

2.  $\cos(\theta/2) = \sqrt{\frac{1 + \cos(\theta)}{2}}$

3.  $\tan(\theta/2) = \sqrt{\frac{1 - \cos(\theta)}{1 + \cos(\theta)}}$