

# 5.2 - Sum and Difference Identities

## Sine/Cosine Identities

RED - Provided on quiz

### Sum/Difference of Angles

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

### Cofunctions

5.  $\cos \theta = \sin\left(\frac{\pi}{2} - \theta\right)$
6.  $\sin \theta = \cos\left(\frac{\pi}{2} - \theta\right)$

## Tangent Identities

7.  $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$
8.  $\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$

# 5.3 - Double-Angle Identities

$$9. \sin(2A) = 2 \sin A \cos A$$

$$10. \cos(2A) = 1 - 2 \sin^2 A$$

$$11. \cos(2A) = \cos^2 A - \sin^2 A$$

$$12. \cos(2A) = 2 \cos^2 A - 1$$

$$13. \tan(2A) = \frac{\sin(2A)}{\cos(2A)}$$

$$14. \tan(2A) = \frac{2 \tan A}{1 - \tan^2 A}$$

# 5.4 - Half-Angle Identities

RED - Provided on quiz

$$15. \sin\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 - \cos \theta}{2}}$$

$$17. \tan\left(\frac{A}{2}\right) = \pm \sqrt{\frac{1 - \cos A}{1 + \cos A}}$$

$$16. \cos\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 + \cos \theta}{2}}$$

$$18. \tan\left(\frac{A}{2}\right) = \frac{1 - \cos A}{\sin A}$$

$$19. \tan\left(\frac{A}{2}\right) = \frac{\sin A}{1 + \cos A}$$

