

Name: _____

Identities Reference Sheet

Factoring Patterns

$$a^2 - b^2 = (a + b)(a - b)$$

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$ac + bc = c(a + b)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

5.1 Basic Identities

$$\sin A = \frac{1}{\csc A}$$

$$\cos A = \frac{1}{\sec A}$$

$$\tan A = \frac{1}{\cot A}$$

$$\tan A = \frac{\sin A}{\cos A}$$

$$\csc A = \frac{1}{\sin A}$$

$$\sec A = \frac{1}{\cos A}$$

$$\cot A = \frac{1}{\tan A}$$

$$\cot A = \frac{\cos A}{\sin A}$$

$$\sin^2 A + \cos^2 A = 1$$

$$\tan^2 A + 1 = \sec^2 A$$

$$\cot^2 A + 1 = \csc^2 A$$

5.2 Sum & Difference Formulas

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

$$\tan(A + B) = \frac{\sin(A+B)}{\cos(A+B)}$$

$$\tan(A - B) = \frac{\sin(A-B)}{\cos(A-B)}$$

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

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

5.3 Double Angle Formulas

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

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

$$= 2\cos^2 A - 1$$

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

$$= 1 - 2\sin^2 A$$

5.4 Half Angle Formulas

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

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

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

$$= \frac{1 - \cos A}{\sin A}$$