Name: _____ Per: _____ Date: _____

Trigonometry with PreCalculus
Midterm Reference Sheet

————————— Basic Identities —————————

$$\sin A = \frac{1}{\csc A} \qquad \cos A = \frac{1}{\sec A} \qquad \tan A = \frac{1}{\cot A} \qquad \tan A = \frac{\sin A}{\cos A}$$

$$\csc A = \frac{1}{\sin A} \qquad \sec A = \frac{1}{\cos A} \qquad \cot A = \frac{1}{\tan A} \qquad \cot A = \frac{\cos A}{\sin A}$$

$$\sin^2 A + \cos^2 A = 1 \qquad\qquad \tan^2 A + 1 = \sec^2 A \qquad\qquad \cot^2 A + 1 = \csc^2 A$$

————————— Sum & Difference Formulas —————————

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

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

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

————————— Double Angle Formulas —————————

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

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

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

————————— Half Angle Formulas —————————

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

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