TRIGONOMETRIC IDENTITES
(Can be used for Test 2 and Test 3)

Sum and Difference Identities:

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

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

Half-Angle Identities:

$$\cos \frac{A}{2} = \pm\sqrt{\frac{1+\cos A}{2}}$$

$$\sin \frac{A}{2} = \pm\sqrt{\frac{1-\cos A}{2}}$$

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

TRIGONOMETRIC IDENTITIES
(Can be used for the Final Exam Only)

Sum and Difference Identities:

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

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

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

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

Double-Angle Identities:

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

$$\sin 2A = 2\sin A \cos A$$

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

Half-Angle Identities:

$$\cos \frac{A}{2} = \pm\sqrt{\frac{1 + \cos A}{2}}$$

$$\sin \frac{A}{2} = \pm\sqrt{\frac{1 - \cos A}{2}}$$

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