TRIGONOMETRIC IDENTITIES
(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:

\[ \cos \left( \frac{A}{2} \right) = \pm \sqrt{\frac{1 + \cos A}{2}} \]
\[ \sin \left( \frac{A}{2} \right) = \pm \sqrt{\frac{1 - \cos A}{2}} \]
\[ \tan \left( \frac{A}{2} \right) = \pm \frac{\sqrt{1 - \cos A}}{\sqrt{1 + \cos A}} \]
\[ \tan \left( \frac{A}{2} \right) = \frac{\sin A}{1 + \cos A} \]
\[ \tan \left( \frac{A}{2} \right) = \frac{1 - \cos A}{\sin A} \]
TRIGONOMETRIC IDENTITIES
(Can be used for the Final Exam Only)

Sum and Difference Identities:

\[
\begin{align*}
\cos(A - B) &= \cos A \cos B + \sin A \sin B \\
\cos(A + B) &= \cos A \cos B - \sin A \sin B \\
\sin(A + B) &= \sin A \cos B + \cos A \sin B \\
\sin(A - B) &= \sin A \cos B - \cos A \sin B \\
\tan(A + B) &= \frac{\tan A + \tan B}{1 - \tan A \tan B} \\
\tan(A - B) &= \frac{\tan A - \tan B}{1 + \tan A \tan B}
\end{align*}
\]

Double-Angle Identities:

\[
\begin{align*}
\cos 2A &= \cos^2 A - \sin^2 A \\
\cos 2A &= 1 - 2\sin^2 A \\
\cos 2A &= 2\cos^2 A - 1 \\
\sin 2A &= 2\sin A \cos A \\
\tan 2A &= \frac{2\tan A}{1 - \tan^2 A}
\end{align*}
\]

Half-Angle Identities:

\[
\begin{align*}
\cos \frac{A}{2} &= \pm \sqrt{\frac{1 + \cos A}{2}} \\
\sin \frac{A}{2} &= \pm \sqrt{\frac{1 - \cos A}{2}} \\
\tan \frac{A}{2} &= \pm \sqrt{\frac{1 - \cos A}{1 + \cos A}} \\
\tan \frac{A}{2} &= \frac{\sin A}{1 + \cos A} \\
\tan \frac{A}{2} &= \frac{1 - \cos A}{\sin A}
\end{align*}
\]