M182 Trig Formula Sheet **Name:**_____

Notation:

1. Formulas marked with a $\star$ should be memorized. These formulas will NOT be provided to you on exams or quizzes.
2. The formulas marked with a $\circ$ will be used less often, but you must familiarize yourself with them because they are essential for many of the problems you will be asked to do in this course. These forumulas WILL BE provided to you on exams and quizzes, when needed.
3. Finally, formulas marked with $\Rightarrow$ are problems you need to know how to derive, but they come up so often that it is convenient to have them immediately available. In most cases, these formulas will NOT be provided to you on exams or quizzes.

Trig identities:

$\star\ \sin^2 x + \cos^2 x = 1$

$\star\ \sec^2 x = 1 + \tan^2 x$

$\star\ \sin^2 x = \frac{1}{2}(1 - \cos(2x))$

$\star\ \cos^2 x = \frac{1}{2}(1 + \cos(2x))$

$\circ\ \sin x\ \cos x = \frac{1}{2}\sin(2x)$

$\circ\ \sin A\ \cos B = \frac{1}{2}[\sin(A-B) + \sin(A+B)]$

$\circ\ \sin A\ \cos B = \frac{1}{2}[\cos(A-B) - \cos(A+B)]$

$\circ\ \cos A\ \cos B = \frac{1}{2}[\cos(A-B) + \cos(A+B)]$

Useful Trig integrals:

$\Rightarrow\ \int \tan(x)\,dx = \ln|\sec x| + C$

$\Rightarrow\ \int \sec(x)\,dx = \ln|\sec x + \tan x| + C$

$\Rightarrow\ \int \sin^4(x)\,dx = \frac{3}{8}x - \frac{1}{4}\sin(2x) + \frac{1}{32}\sin(4x) + C$

$\Rightarrow\ \int \cos^4(x)\,dx = \frac{3}{8}x + \frac{1}{4}\sin(2x) + \frac{1}{32}\sin(4x) + C$

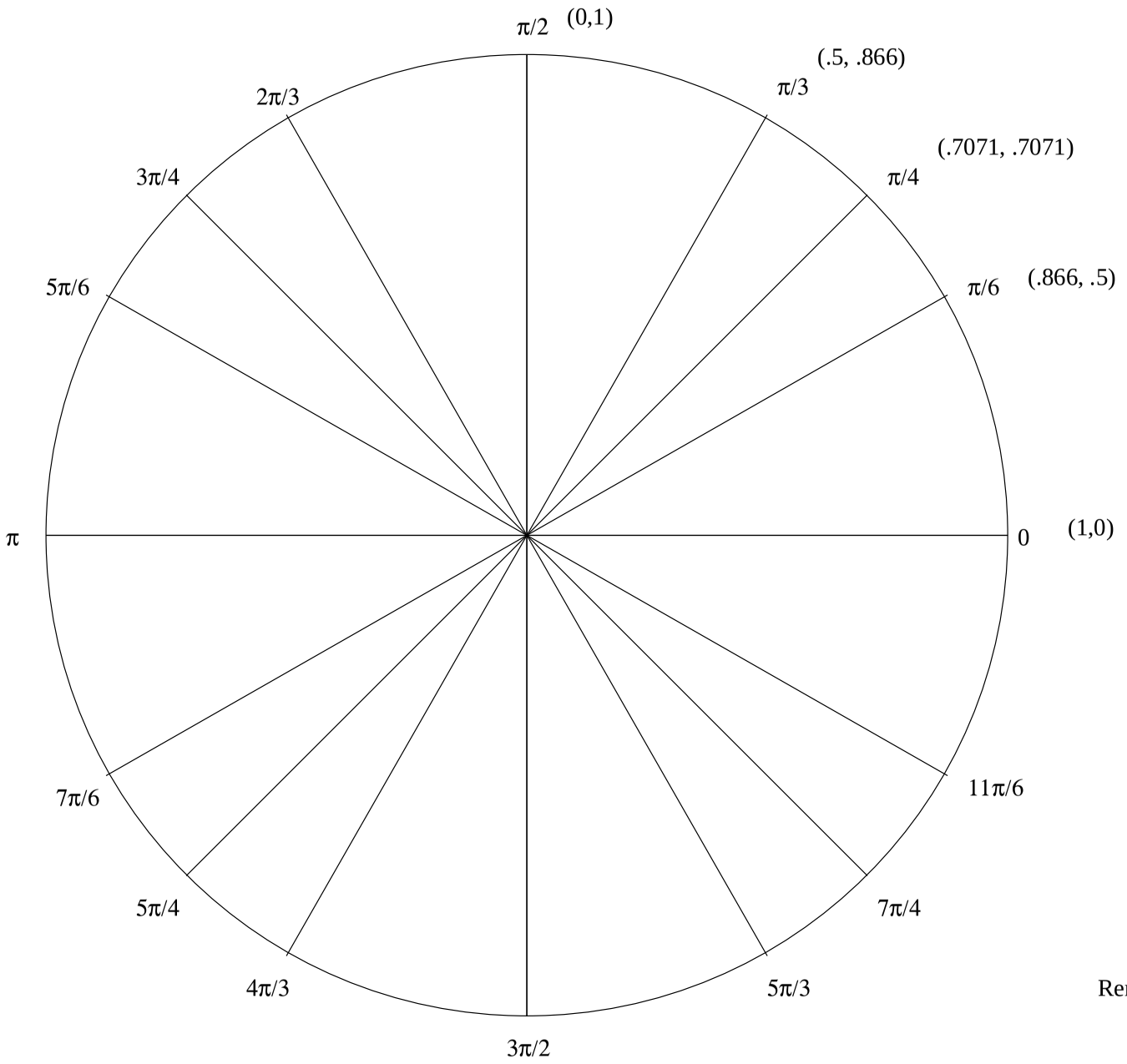
$\Rightarrow\ \int \frac{1}{x^2+a^2}\,dx = \frac{1}{a}\tan^{-1}\frac{x}{a} + \mathrm{C}$

Derivatives of Inverse Trig Functions:

$\star\ \frac{d}{dx}[\sin^{-1} x] = \frac{1}{\sqrt{1-x^2}}$ $\qquad$ $\circ\ \frac{d}{dx}[\csc^{-1} x] = \frac{-1}{x\sqrt{x^2-1}}$

$\star\ \frac{d}{dx}[\cos^{-1} x] = \frac{-1}{\sqrt{1-x^2}}$ $\qquad$ $\circ\ \frac{d}{dx}[\sec^{-1} x] = \frac{1}{x\sqrt{x^2-1}}$

$\star\ \frac{d}{dx}[\tan^{-1} x] = \frac{1}{1+x^2}$ $\qquad$ $\circ\ \frac{d}{dx}[\cot^{-1} x] = \frac{-1}{1-x^2}$



Remember: (cos, sin)