

Name: _____ Student ID #: _____

JUSTIFY ALL YOUR ANSWERS

DO NOT ANSWER YOUR QUESTIONS ON THIS PIECE OF PAPER

USE PENCIL

This exam has 4 questions, for a total of 60 points.

1. Verify the following identities

(a) (10 points) $\frac{1 - \sin x}{1 + \sin x} = (\sec x - \tan x)^2$,

(b) (10 points) $\frac{\cot x - 1}{\cot x + 1} = \frac{1 - \tan x}{1 + \tan x}$, and

(c) (10 points) $\sin\left(\frac{\pi}{2} - x\right) = \sin\left(\frac{\pi}{2} + x\right)$.

2. (10 points) Use an addition or subtraction formula to find the exact value of $\sin\left(-\frac{5\pi}{12}\right)$.

3. (10 points) Find $\sin 2x$, $\cos 2x$, $\tan 2x$, if $\cot x = 2/3$ and $\sin x > 0$.

4. (10 points) Find $\sin \frac{x}{2}$, $\cos \frac{x}{2}$, $\tan \frac{x}{2}$, if $\cos x = -4/5$ and $180^\circ < x < 270^\circ$.