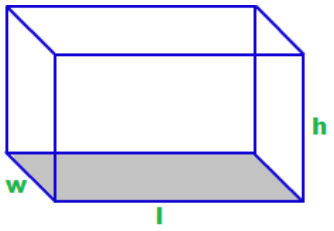
Honors Assignment

Name _____ Period _____

Mini Choice Board: GPS Honors Pre Calculus - Trigonometric Identities

Directions: Complete three activities from this 3x3 grid in a tic-tac-toe arrangement (vertically, horizontally, or diagonally). Show all work on separate paper. You may work by yourself or with *one* partner. Each box is worth 33 points for a total of 99 points (rounded to 100). The center box is worth 15 additional bonus points.

1. ***Simplify*** the following two trig expressions to a single term or number. **Show** all work. • $\frac{\csc x - \sin x}{\csc x}$ • $\frac{\sin^3 x}{\cos x} + \sin x \cos x$	2. **Analyze** the following problem and student work. Find the error(s) made by the student. **Explain** the error(s) made. **Support** your explanation by including the correct simplification. $\frac{\sin x}{\cos x} + \frac{\cos x}{1 + \sin x}$ $= \sin x(1 + \sin x) + \cos x \cdot \cos x$ $= \sin x + \sin^2 x + \cos^2 x$ $= \sin x$	3. **Verify** 10 trig identities from the (1 – 31) HANDOUT given that accompanies this project. • You MUST choose 4 from the left column. • You MUST choose 6 from the right column. • Show all steps linearly. • Don't skip any steps.
4. **Verify** 10 trig identities from the (1 – 31) HANDOUT given that accompanies this project. • You MUST choose 3 from the left column. • You must choose 7 from the right column. • Show all steps linearly. • Don't skip any steps.	5. **Compose** three different, *original,* trigonometric expressions that meet the following criteria: • Starts with at least two different trig functions *(i.e.* $\sin\theta$, $\cos\theta$, *etc.)* • Simplifies to a single trig function • Simplifies in 3 or four steps. **THEN, simplify** these expressions, showing all interim steps.	6. **Write** an expression for the volume of the rectangular prism below. **Simplify** your expression to a single trig expression or single number.  $l = \csc\theta \quad w = \cot\theta$ $h = \sec^2\theta - 1$
7. On notebook sheet of paper, **illustrate** how to verify the following expression to its answer. **Show** all work, and **describe, *in words*,** what you did to simplify each step in a paragraph. * $(1 - tanx)(1 - cotx) = 2 - \sec x \csc x$ * $\frac{\sin 2x}{1 + \cos 2x} = \tan x$ * $\sin(x+y)sin(x-y) = sin^2x - sin^2y$	8. **Solve** the following trig equations. Show all steps. All answers are contained $[0, 2\pi]$ • $2sin^2x - 5sinx + 2 = 0$ • $sinx = cos2x$ • $cos2xcsc^2x = 2\cos 2x$	9. **Review.** Solve the problem below. Sketch a picture and label. Show all steps and formulas used to obtain all of your answers: *Two tugboats that are 120 ft apart, pull a barge. If the length of one cable is 212 ft. and the length of the other is 230 ft.. a) find the angle formed by the two cables. b) find the remaining angles. c) how much area (body of water) is contained between everything?