Mth 112 Lab 5 *Franz Helfenstein* **NAME**

Answers must be clearly **legible**. They should be, **simplified** and **boxed** or **circled**. Unless otherwise stated write answer as an **exact** integer or fraction. For approximate answers use **two** decimal accuracy. 20 pts

1) Determine the exact value of sin 15°.

2) Determine the exact value of tan 15°.

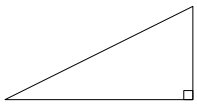
3) Determine the exact value of sin 22 $\frac{1}{2}$°.

4) Determine the exact value of tan $7\pi/12$.

5) Algebraically solve for x in radians: $\frac{3\tan x + 7}{2} = 5 - \frac{6\tan x}{3}$

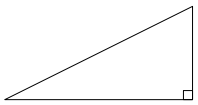
6) $\sin y = \frac{3x}{5}$ Give <u>tan y</u> as a function of x.

(a) label the triangle
(b) complete using Pythag. Thm.
(c) determin tan y



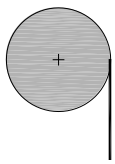
7) $\tan^{-1}\frac{3x+1}{2} = y$ Give <u>cos y</u> as a function of x.

(a) label the triangle
(b) complete using Pythag. Thm.
(c) determin cos y



8) A truck with 100 cm tires is traveling down the hi-way at 75 kph. What are the truck tire's rpm?

9) How many <u>radians</u> will a 4 cm <u>diameter</u> pulley rotate to lift cable 1 meter?



10) Solve <u>x + sin x = 5</u>. **Solve Using the Graphing Calculator**.

x = _____ Explain why must x be in radians and <u>cannot</u> be in degrees?

Use these identities to simplify the following trigonometric expressions/equations to a single term:

$\sin^2 x + \cos^2 x = 1$	$\tan x = \frac{\sin x}{\cos x}$	$\cot x = \frac{1}{\tan x}$	$\sec x = \frac{1}{\cos x}$	$\csc x = \frac{1}{\sin x}$

11) Simplify: $\sin^2 x \csc x =$

12) Simplify: $\sec w - \sin w \tan w =$

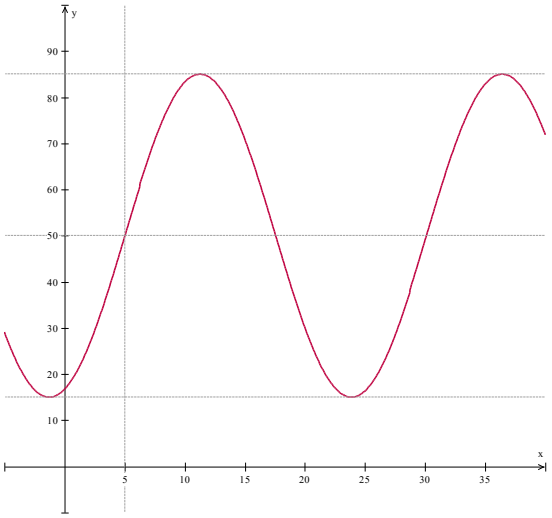
13) Simplify: $\sec y - \frac{\tan y}{\csc y} =$

14) Simplify: $\csc^2 x - \cot^2 x =$

16) Algebraically solve for x: $2 \cos x = -5 \tan x + 2 \sec x \quad x \in [0, 2\pi]$

17) Algebraically solve for x: $\sec^2 x - 1 = \sqrt{3}(-1 + \tan x) + \tan x \quad x \in [0, 2\pi]$

18) Give this graph in the form: $y = A \sin[b(x - h] + k$



19) Find the sine function with a wavelength of 100 m, a height from trough to crest of 20m. Assume h or φ = 0.

20) Find the sine function with a height from trough to crest of 20m, and passing a buoy every 2 min. Assume h or φ = 0.

Bonus Simplify $\frac{\sin^2 t}{\sec t - 1} + \frac{\sin^2 t}{\sec t + 1} =$