Math 1730
Exam 3 (50 mins, 40 pts) 

Name: ____________________________

1. Plot $y = \tan x$ below (3 pts).

2. Show that $f(x) = \tan x$ is either an even or odd function (3 pts).

3. Plot $y = -3 \sin x$ below (3 pts).
4. What is the period of $y = 2 \cos(4x)$? (3 pts)

5. What is the amplitude of $y = 2 \cos(4x)$? (3 pts)

6. Find $\cot(45^\circ)$. (3 pts)

7. Find the angle that is supplementary to $92^\circ 13' 20''$. (2 pts)

8. What is the exact radian measure of $-720^\circ$? (2 pts)

9. Evaluate $\sec(-720^\circ)$. (3 pts)

10. What is the exact measure in degrees of $\frac{3\pi}{2}$ radians? (2 pts)

11. Evaluate $\tan\left(\frac{3\pi}{2}\right)$. (3 pts)

12. Simplify $\sin^2 \theta \sec^2 \theta - \sec^2 \theta$. (3 pts)
13. Verify the following identity (4 pts)

\[
\sqrt{\frac{\sec(-x) - \tan(x)}{\sec(-x) - \tan(-x)}} = \frac{1}{\sec(x) + \tan(x)}
\]

14. Find the exact values of the 6 trigonometric functions of \( \theta \) where \( \theta \) is in standard position and the terminal side of \( \theta \) is in the 4th quadrant on the line given by \( 3y + 5x = 0 \). (3 pts)

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Extra Credit:
Verify the following identity (2 pts)

\[ \log(\sin \theta) - \log(1 + \cos \theta) = \log(\csc \theta - \cot \theta) \]

Using \( \cos^2 x + \sin^2 x = 1 \) derive the identity \( 1 + \tan^2 x = \sec^2 x \) (1 pt).

Simplify \( (2r \sin \theta \cos \theta)^2 + r^2(\cos^2 \theta - \sin^2 \theta)^2 \) (2 pts).
Show all work!