You are not permitted to use a calculator on this exam.

In order to receive full credit, you must show your work. Be wary of doing computations in your head. Instead, write out your computations on the exam paper.

If you need more room, use the backs of the pages and indicate to the grader that you have done so.

Raise your hand if you have a question.

Good luck!
(a) (5 points) Find the exact value of $\tan(180^\circ)$.

(b) (5 points) Find the value of $4 \sin(33^\circ) \csc(33^\circ) - 7 \sec(58^\circ) \cos(58^\circ)$.

(c) (10 points) Find the exact value of $\sin(990^\circ)$. 


Determine the amplitude, period, and phase shift of $y = \frac{1}{2} \sin(\pi x + \pi)$. Then graph the function (you should graph the function for more than one period).
(3) (10 points)
(a) (5 points) Write an equation of a cosine function with amplitude is 4, period is $\frac{\pi}{3}$, and phase shift is $\frac{1}{2}$.

(b) (5 points) Find the asymptotes of $y = 2 \csc(2x)$ on the interval $[0, \pi]$.

(4) (10 points)
(a) (5 points) What is the domain of tangent?

(b) (5 points) Why do we need to do restrictions on the domains of trigonometric functions to define inverse trigonometric functions?
5 (20 points) Graph the function $y = 2 \cot(x - \frac{\pi}{2})$. 
6. (10 points) The point $P = (-\frac{5}{13}, -\frac{12}{13})$ is a point on the unit circle corresponding to real number $t$. Find the exact value of $\tan(t)$.

7. (20 points)

(a) (10 points) Find the exact value of $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$.

(b) (10 points) Find the exact value of $\cos^{-1}\left(-\frac{1}{2}\right)$.