MATH 121 – Precalculus
Fall 2014

Exam 2
October, 27

Name: _____

UIN: _____

T/TH class time: _____

- You are expected to abide by the University's rules concerning Academic Honesty.
- You may *not* use your books, notes, or any electronic device including calculators and cell phones.
- Show ALL your work. Unsupported answers will not receive credit.
- Always state a complete answer to the problem.

(9 pts) **1.** Suppose that $h(x) = e^x - 4$.

a) State the domain of $h(x)$.

b) Sketch the graph of $h(x)$.

(9 pts) **2.** Suppose that $g(x) = \log_{1/10}(x^2+16) + \log_{1/10}(7-x)$. Evaluate g at $x = 3$. Your final answer should not involve logarithms.

(7 pts) **3.** Suppose that $h(x) = 9^{x-1} - 3$. If $h(x) = 24$ find x. Your final answer should not involve logarithms.

(9 pts) **4.** Suppose that $f(x) = \ln(x + 5)$.

a) State the domain of $f(x)$.

b) Sketch the graph of $f(x)$.

(12 pts) **5.** Suppose that α and β are central angles in the unit circle, and $\alpha = 105^\circ$ while $\beta = \frac{2}{3}\pi$.

a) On the same unit circle draw α and β in standard position. Indicate the amount and direction of rotation.

b) Find the difference between the area of the sector of the unit circle cut by α and the area of the sector cut by β.

(15 pts) **6.** Draw each angle in standard position then find the exact value of the trigonometric function:

a) $\sin(-\frac{2\pi}{3})$ b) $\cos(5\pi)$ c) $\tan(\frac{7\pi}{4})$

(17 pts) **7.** Suppose that $\cot\theta = -\frac{3}{4}$ and $\sin\theta > 0$. Find the exact value of the remaining trigonometric functions: $\sin\theta$, $\cos\theta$, $\tan\theta$, $\sec\theta$, $\csc\theta$.

(12 pts) **8.** Given a sinusoidal function $y = -5\sin(\pi x + \frac{\pi}{3}) + 1$, find

Amplitude :

Period :

Phase shift :

Vertical shift (centerline) :

(10 pts) **9.** Sketch the graph of $y = 2\sin(x + \pi/6)$. Include at least two periods and mark key points on your graph.