Name: _____   Math 1190 Exam 1 Part 1 Retake

Directions:

- You have 25 minutes to complete this exam. The exam is worth 35 points (out of 100) of your Exam 1 grade.

- NO CALCULATORS or CELL PHONES ANYWHERE IN SIGHT.

- **Read the directions carefully** to make sure you answer the question. Show all work.

(1) (2 points each) Evaluate each expression exactly (answer in radians where appropriate).

(a) $\ln e^3 - \ln 1 =$

(c) $\cos^{-1} 1 =$

(b) $\cos\left(\frac{-\pi}{6}\right) =$

(d) $\cot\left(\frac{\pi}{3}\right) =$

(2) (4 points) Find all values of x satisfying the equation on the interval $0 \leq x \leq 2\pi$:

$$\sin(x)\cos(x) = \sin(x)$$

(3) (4 points) Write the following expression so that it has no fractions, radicals, or products. Negative and fractional exponents are acceptable.

$$\frac{\sqrt[3]{x} + 1}{x^2}$$

(4) (3 points) Solve: $x^2 + 5x = -6$.

(5) (4 points) Use appropriate properties of logarithms to completely expand the following into a sum, difference, and constant multiple of logarithms.

$$\ln\left(\frac{x^2 \cos(x)}{x+5}\right)$$

(6) (4 points) Sketch the graph of each of the functions below. Include x- and y- intercepts, if applicable.

$$f(x) = \tan x \qquad\qquad f(x) = e^x$$

(7) (4 points) Let $S = f(t)$ be the number of inches of snow that had fallen t hours into a snow-storm in Chicago.

(a) Describe what $f^{-1}(8) = 2$ means. Include units.

(b) True or false, and defend your answer: If $f(5) = 18$, then $f^{-1}(5) = \frac{1}{18}$.

(8) (4 points) Let $f(x) = x^2 + x$. Evaluate and simplify $\frac{f(1+h) - f(1)}{h}$.