Printed Name _____ Signature _____

Calculus II Quiz #1

Show your work and clearly label your answers on this quiz. *No scrap paper, calculators, or notes are allowed* (or needed). This quiz is scored out of 55 points. (There are 65 points possible.) You have 30 minutes to complete the quiz.

To get credit on a problem, you *must* show work. Even if you can do the work in your head, the point of these exercises is to get you to articulate your thought processes.

Problem 1 (10x3 pts) For each function, give a domain (perhaps restricted) on which the function is one-to-one. Give the range of the function under that domain, and the inverse function.

(a) $f(x) = \frac{2x+5}{x+3}$

(b) $g(x) = \sqrt{\sqrt{x} - 10}$

(c) $h(x) = \arcsin(x - 1)$

Problem 2 (10 pts)

Compute the equation of the line tangent to the *inverse* of the function $f(x) = 8 - x^3$ at the point $(a, f^{-1}(a)) = (7, 1)$.

Problem 3 (10+5 pts) Compute

$$\frac{d}{dx}\left(\cos(\arcsin(\sqrt{x}))\right)$$

and evaluate the derivative at $x = \frac{1}{4}$. (Hint: Notice that much of this problem simplifies!)

Problem 4 (10 pts) Compute

$$\int_0^1 \frac{x}{x^4+4} dx.$$

Hint:

$$\frac{d}{dx}\left(\arctan\left(u\right)\right) = \frac{du}{u^2+1}.$$