Spring 2015   **Your name:** _____

Math 0220   **Your TA's name:** _____

No calculators, no notes, no books are permitted. L'Hospital's rule is not allowed.

SHOW ALL WORK (no work = no credit). Write neatly. Simplify your answers.

1. [5 points] Use differentials to estimate the amount (in m^3) of paint needed to apply a coat of paint 0.03 cm thick to a ball with diameter 20 m.

2. [5 points]   Find y' if $y = (\sin x)^x$.

bonus problem [5 points extra] $f(x) = \sin^2 x + 5 \cos^2 x,\ \ 0 \le x \le \frac{\pi}{2}$.   Find $(f^{-1})'(4)$.
Simplify your answer.