Fall 2017 $\qquad$ **Quiz 4** $\qquad$ Math 0220

20 minutes $\qquad$ **Name:** _____

No calculators, no notes, no books. Show all your work (no work $=$ no credit). Write neatly.

1. Find y'. Do not simplify your answer.

   (a) (2 points) $y(x) = e^{x \cos x}$

   (b) (2 points) $y(x) = \dfrac{2}{\ln x}$

(c) (2 points) $y(x) = x^{3x}$

(d) (2 points) $y(x) = \sin^{-1}(3x - 2)$

(e) (2 points) $y(x) = \tanh^{-1}(3x - 2)$

2. Using l'Hospital's Rule find the limit.

(a) (3 points) $\displaystyle \lim_{x \to \infty} \frac{\ln x}{\sqrt{x}}$

(b) (2 points) $\displaystyle \lim_{x \to 0} \frac{4^x - 3^x}{x}$

bonus problem (5 points extra)   Simplify the expression $\cos\left(2\tan^{-1}x\right)$.