Take-Home Quiz 2

Math 132 Section 22

Due Wednesday, January 18, 2006

Do not merely write down an answer—write also something to convince the skeptical and foolish reader (namely, Jim) that your answer is correct. Mathematics is not a collection of disconnected truths; it is a way to move from one truth to another.

Problem 1. (2 points). Compute

$$\frac{d}{dx}\left(\sin 3x - \cos 5x\right).$$

Problem 2. (2 points). Compute

$$\frac{d}{dx}\left(\frac{\sin 2x}{\cos 3x}\right).$$

Problem 3. (2 points). Compute

$$\frac{d}{dx}\left(\frac{\sin^2 x}{\sin(x^2)}\right).$$

Problem 4. (2 points). Recall that $\cos x = \sin(\pi/2 - x)$. Calculate the derivative of $\cos x$ with respect to x by calculating

$$\frac{d}{dx}\sin\left(\frac{\pi}{2} - x\right).$$

Problem 5. (3 points). Recall the identity $\sin(2x) = 2\sin x \cos x$. Differentiate both sides of this equation with respect to x to get another identity.

Problem 6. (3 points). When does

$$\frac{d}{dx}\sin\left(\sin x\right)$$

equal zero?