

**Math 124 Quiz #5**  
**October 27, 2009**

Name: \_\_\_\_\_

Simplify your answers. Show all work on a separate paper. Staple this sheet to your answers.

1. Differentiate the following. Do **not** simplify your answers.

(a) (2 pts.)  $h(t) = \frac{\sec t + 1}{7t^3}$

(b) (3 pts.)  $y = 4x + e^x(11 \sin x + \frac{1}{x})$

2. (2 pts.) Evaluate the following limit:  $\lim_{x \rightarrow 2\pi} \frac{3 \sin x}{\tan x}$  (Justify your answer.)

3. (3 pts.) Find values of  $x$  with  $0 \leq x \leq 2\pi$  at which the function  $f(x) = 4 \cos x + 7x$  has a tangent line with slope 5.

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**Note:** Here are some derivative rules.

$$\frac{d}{dx} \left[ \frac{f(x)}{g(x)} \right] = \frac{g(x) \cdot f'(x) - f(x) \cdot g'(x)}{[g(x)]^2}$$

$$\frac{d}{dx} [\sin x] = \cos x$$

$$\frac{d}{dx} [\cos x] = -\sin x$$

$$\frac{d}{dx} [\tan x] = \sec^2 x$$

$$\frac{d}{dx} [\sec x] = \sec x \cdot \tan x$$