Math 109, PRACTICE Quiz 5: Differentiation with Trig. Functions

Name: Amy _____ **Section:** _____

You have 10 minutes to complete the following problems, without using your notes, book, or calculator.

1. Differentiate:

$\frac{d}{dx}\sin x = \cos x$ $\quad$ $\frac{d}{dx}\tan x = \sec^2 x$ $\quad$ $\frac{d}{dx}\cot x = -\csc^2 x$

$\frac{d}{dx}\cos x = -\sin x$ $\quad$ $\frac{d}{dx}\sec x = \sec x \tan x$ $\quad$ $\frac{d}{dx}\csc x = -\csc x \cot x$

2. Differentiate. Do *not* simplify.

(a) $\frac{d}{dx}\, x^3 \cos x = 3x^2 \cos x + x^3(-\sin x)$ (Product Rule)

(b) $\frac{d}{dx}\, \frac{\tan x}{2x + x^4} = \frac{\sec^2 x\,(2x + x^4) - \tan x\,(2 + 4x^3)}{(2x + x^4)^2}$ (Quotient Rule)

(c) $\frac{d}{dx}\, \sin^2 x = 2 \sin x \cos x$ (Chain Rule)

(d) $\frac{d}{dx}\, \csc(4x^5) = -\csc(4x^5)\cot(4x^5) \cdot (20x^4)$ (Chain Rule)