Circuit Training – Product and Quotient Rules

Name _____

Directions: Begin in cell #1. Find the derivative. Search for your answer, and then call that cell #2. Proceed in this manner until you complete the circuit. You may need to attach additional sheets to show your best work.

Answer: $-\dfrac{7}{x^2}$ # __1__ $\quad y = (2x-5)(3x+7)$	Answer: $\dfrac{5x^2+18x+9}{2\sqrt{x}}$ # _____ $\quad y = \cos^2 x$
Answer: $\sec^2 x$ # _____ $\quad y = \dfrac{3x+7}{x^3}$	Answer: $-\dfrac{9}{(3x+7)^2}$ # _____ $\quad y = \dfrac{1+\cos x}{1+\sin x}$
Answer: $\dfrac{-2x\sin x - \cos x + x^2 \cos x}{\sin^2 x}$ # _____ $\quad y = \dfrac{x^2}{3x+7}$	Answer: $-\dfrac{2}{3}x^2 - \dfrac{11}{9}x + \dfrac{17}{18}$ # _____ $\quad y = \sqrt{x}(x+3)^2$
Answer: $12x - 1$ # _____ $\quad y = \dfrac{2x-5}{3x+7}$	Answer: $\sec x \tan x$ # _____ Given $f(5) = 3$, $f'(5) = 3x + 7$, $g(5) = 2x - 1$, $g'(5) = \frac{1}{2}$. If $h(t) = f(t) \cdot g(t)$, calculate $h'(5)$.
Answer: $\dfrac{-3(2x+7)}{x^4}$ # _____ $\quad y = \dfrac{3x+7}{\sqrt{x}}$	Answer: $2\sin x \cos x$ # _____ $\quad y = \tan x$ (HINT: Rewrite as $\dfrac{\sin x}{\cos x}$.)

Answer: $x(2\cos x - x\sin x)$ # _____ $y = x\sin x$	Answer: $-2\sin x\cos x$ # _____ $y = \csc x$
Answer: $6x^2 + 11x - \frac{11}{2}$ # _____ $y = \cot x$	Answer: $\frac{3x-7}{2x\sqrt{x}}$ # _____ $y = \sec x$ (HINT: Rewrite this trig function.)
Answer: $\frac{3x^2+14x}{(3x+7)^2}$ # _____ $y = \frac{3x^2+7x}{x^2}$	Answer: $-\csc x\cot x$ # _____ $y = \frac{1-x^2}{\sin x}$
Answer: $x\cos x + \sin x$ # _____ $y = \frac{3}{3x+7}$	Answer: $\frac{29}{(3x+7)^2}$ # _____ $y = x^2\cos x$
Answer: $-\csc^2 x$ # _____ Given $f(5) = 3$, $f'(5) = 3x + 7$, $g(5) = 2x - 1$, $g'(5) = \frac{1}{2}$. If $k(t) = \frac{g(t)}{f(t)}$, calculate $k'(5)$.	Answer: $-\frac{\sin x+\cos x+1}{(1+\sin x)^2}$ # _____ $y = \sin^2 x$ (HINT: Rewrite as $\sin x \cdot \sin x$.)

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