

Advanced Derivative Rules

4.2A – Differentiating Using Two Rules

A: Find the derivative of each function. Factor answers when appropriate.

#1) $h(x) = [(x^3 - x)^5 + x^2]^2$

#2) $h(x) = [(x - 1)^2 + 5x]^7$

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#3) $y = 4x^2(9x - 1)^3$

#4) $h(x) = (x^2 + 1)^4(6x - 1)^5$

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#5) $y = \sin(2x) \cos^2(x)$

#6) $y = \sin^9(x) \cos^3(x)$

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$$\#7) y = \frac{\cos^2(x)}{\cot^2(x)}$$

$$\#8) y = -\tan^2(55x) + \sec^2(55x) + \sin^2(x)$$

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$$\#9) y = 2 \sin(x) \cot(x) \sec(x) + 2 \tan^2 x$$

$$\#10) y = \sin(x) [\sin(x) + \cos(x)] + \cos^2(x) - \frac{\tan^2(x)+1}{\cos^2(x)}$$

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George's Headache

#11) While traveling by donkey to California, George's body takes a beating. He starts to develop a headache. Trying to gain some relief, he pops a couple of Advil. The strength of George's reaction to a dose of x milligrams of Advil is $R(x) = 2x\sqrt{10 - \frac{1}{2}x}$ for $0 \leq x \leq 20$. If $R'(x)$ is called the sensitivity of the Advil, find George's sensitivity to the Advil for a dose of 10 mg. (Use a sentence answer.)