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MATH 140 : CALCULUS II

Problem Set 3 – due Wednesday, February 19th

INSTRUCTIONS:

Please submit this at the *start* of Wednesday's class. Don't worry if you don't manage to get an answer for any particular question, but please give each problem an honest try (and record what you were able to accomplish, even if you didn't solve it). Eventually you should make sure to understand the problems, as some of them may appear on next week's in-class quiz. You are encouraged to collaborate with other students on these problems. However, please write up your solutions in isolation from one another.

3.1 In class we saw that $\frac{d}{dx}x = 1$, $\frac{d}{dx}x^2 = 2x$, and $\frac{d}{dx}x^3 = 3x^2$. Using just these three facts plus the product rule, determine $\frac{d}{dx}x^7$. [Ans: $7x^6$]

3.2 In class we used the product rule to show that $\frac{d}{dx}\frac{1}{x} = -\frac{1}{x^2}$.

(a) Use the same type of argument as we did in class to evaluate $\frac{d}{dx}\frac{1}{x^2}$.

(b) Find a different way to use product rule to evaluate $\frac{d}{dx}\frac{1}{x^2}$.

3.3 Use the product rule to evaluate $\frac{d}{dx}\sqrt{x}$.

3.4 Use the product rule and problem **3.1** to determine $\frac{d}{dx}x^{7/2}$.