Math 1232: Single-Variable Calculus 2

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Recitation 2

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Problem 1.   (a) Compute $\log_3(6) + \log_3(9/2)$.

(b) Compute $\log_4(8) - \log_4(2)$.

(c) Rewrite the expression $\log_5(15) + \log_5(75) - \log_5(12)$ as an integer plus a logarithm.

(d) Solve $e^{5-3s} = 10$.

Problem 2. Compute the derivative of $(x+1)^{\sqrt{x}}$.

Problem 3 (Bonus)**.** Use logarithmic differentiation to compute $\dfrac{d}{dx} \dfrac{x^3\sqrt{x^2-5}}{(x+4)^3}$.

Problem 4. Consider the integral $\displaystyle\int_e^{e^4} \dfrac{1}{x\sqrt{\ln x}}\, dx$.

(a) We're going to have to do a u-substitution here. What u looks like it should work?

(b) What do we need to change the bounds to when we do the u-substitution?

(c) Compute $\displaystyle\int_e^{e^4} \dfrac{1}{x\sqrt{\ln x}}\, dx$.

(d) Now try computing $\displaystyle\int \dfrac{1}{x\sqrt{\ln x}}\, dx$ to get the antiderivative.

(e) Now plug e^4 and e in to your antiderivative. What do you notice? How is this related to part (c)?

Problem 5. Compute the following integrals.

(a) $\int e^x \cos(1 + e^x)\, dx$.

(b) $\int \frac{\ln(x)}{x}\, dx$.

Problem 6 (Challenge)**.** Compute $\displaystyle\int \frac{dx}{1 + e^x}$.