

# Math 2315 - Calculus II

Homework #4

Assigned - 2010.01.26

Due - 2010.02.01

Name: \_\_\_\_\_

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Textbook problems:

Section 6.6 - 1, 4, 6, 7, 12, 16, 18, 21, 26, 32, 41, 42, 43

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Fun Problems:

1. Prove that for  $n \geq 2$

$$\frac{d}{dx} \left[ \frac{1}{n} \cosh^{n-1}(x) \sinh(x) \right] = \cosh^n(x) - \frac{n-1}{n} \cosh^{n-2}(x).$$

2. Prove that for  $n \geq 2$

$$\int \cosh^n(x) dx = \frac{1}{n} \cosh^{n-1}(x) \sinh(x) + \frac{n-1}{n} \int \cosh^{n-2}(x) dx.$$

3. Evaluate the following integral:

$$\int \frac{\tanh^{-1}(x)}{x^2 - 1} dx$$