Supplementary Homework Exercises for Section 4.11: Hyperbolic Functions (part 1)

Exercises

Complete the following exercises.

S1. Prove that $\sinh(x+y) = \sinh x \cosh y + \cosh x \sinh y$.

S2. Differentiate each of the following.

(a) $f(x) = \sinh(x^2)$

(b) $g(x) = \operatorname{sech}(x)\tanh(x)$

(c) $y = \sinh^{-1}(2x)$

S3. Integrate each of the following.

(a) $\displaystyle\int \frac{\sinh x}{\cosh^2 x}\,dx$

(b) $\displaystyle\int e^{\tanh x}\operatorname{sech}^2 x\,dx$

(c) $\displaystyle\int \frac{\operatorname{sech}\sqrt{x}\tanh\sqrt{x}}{\sqrt{x}}\,dx$

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