ZCA 110 Kalkulus dan Aljabar
Hyperbolic Functions Problem set

Chapter 26, Schaum's series Calculus, pg. 241, 242

10. Define $\sinh x = \frac{e^x - e^{-x}}{2}$, $\cosh x = \frac{e^x + e^{-x}}{2}$, $\tanh x = \frac{\sinh x}{\cosh x}$, $\operatorname{sech} x = \frac{1}{\cosh x}$. Derive the following results

(a) $D_x(\sinh x) = \cosh x$ and $D_x(\cosh x) = \sinh x$

(b) $D_x(\tanh x) = \operatorname{sech}^2 x$, $D_x(\operatorname{sech} x) = -\operatorname{sech} x \tanh x$

(d) $\sinh(x+y) = \sinh x \cosh x + \cosh x \sinh y$

(g) $\cosh(2x) = \cosh^2 x + \sinh^2 x = 2\cosh^2 x - 1 = 2\sinh^2 x + 1$

23. Graph $y = \sinh x$

24. Evaluate $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx$.