

MATH 126 SPRING 2011, QUIZ 2

1. Find the derivative of  $f(t) = \ln(\sinh(e^t))$ . (Do not worry about domains.)

2. Find the limit.

a.  $\lim_{x \rightarrow 1} \frac{\ln x}{\sin \pi x}$

b.  $\lim_{x \rightarrow -\infty} x^2 e^x$

c.  $\lim_{x \rightarrow 0} \frac{x}{\tan^{-1}(4x)}$

3. a. Prove the identity  $\cosh x + \sinh x = e^x$ .

b. Use part a to prove the identity  $(\cosh x + \sinh x)^n = \cosh nx + \sinh nx$ .  
(Hint: Show that each side of the equality equals  $e^{nx}$ .)