**Math 1B**
**Quiz 9**
**Fri Jun 20, 2008**

What day of the month is your birthday ? ___ ___
What are the last 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___

**YOU MAY USE ANY OF THE IDENTITIES YOU FOUND ON PAGE 1 OF THE HYPERBOLIC SUPPLEMENT WITHOUT PROVING THEM HERE**

**[3 POINTS]** Using implicit differentiation, prove the derivative of $y = \sinh^{-1} x$.

Evaluate the following derivatives and anti-derivatives and simplify. Write your final answers in terms of hyperbolic functions if possible. **(You may use the derivatives and anti-derivatives of the hyperbolic and inverse hyperbolic functions without proving them.)**

**[2 POINTS EACH]**

$$\frac{d}{dx} e^{-2x} \cosh^{-1} 3x$$

$$\frac{d}{dx} \tanh^{-1}(\cos x)$$

$$\int \sinh^3 x \cosh^4 x \, dx$$

$$\frac{d}{dx} \sin^{-1}(\tanh x)$$

**QUESTIONS ON OTHER SIDE**

**[3 POINTS EACH]**

$$\frac{d}{dx}\frac{\sinh x}{1-\cosh x}$$

$$\int e^{-2x}\cosh 3x\,dx$$

$$\int \tanh(\ln x)\,dx$$