1. Simplify the following expressions.
   (i) $e^{2x}e^{-x}$  
   (ii) $(e^x)^2e^{-x}$  
   (iii) $e^{3x}(2e^{-x} - e^{-2x}) + e^x$

2. Evaluate the following expressions.
   (i) $e^{-0.02}$,  
   (ii) $2.2e^{-2t}$ when $t = 3.2$

3. Evaluate the following.
   (i) sinh 3,  
   (ii) tanh 3t when $t = 1.2$.

4. Prove the following identities.
   (i) $\sinh(x + y) = \sinh x \cosh y + \cosh x \sinh y$,  
   (ii) $1 - \tanh^2 x = \text{sech}^2 x$
   In each case you need only use the definitions of the hyperbolic functions in terms of the exponential function.

5. Using the identities for $\sinh 2x$ and $\cosh 2x$ obtain an expression for $\tanh 2x$ in terms of $\tanh x$.

6. Find an identity for $\sinh 3x$ in terms of $\sinh x$. Hint: Start with the identity for $\sinh(x + y)$ with $y$ replaced by $2x$. Take care to obtain the final result in its simplest form.

7. Express the function $f(x) = e^x + 2e^{-x}$ in terms of hyperbolic sine and cosine functions.

8. Evaluate the following logarithms without using a calculator.
   (i) $\log_7 49$,  
   (ii) $\log_2 \frac{1}{4}$,  
   (iii) $\log_4 \frac{1}{2}$.

9. Simplify the following expressions without using a calculator.
   (i) $\ln 24 - \ln 8$,  
   (ii) $2 \ln 3 - 3 \ln 2$,  
   (iii) $\ln(12/7) + 2 \ln(7/2)$.

10. Simplify the following expressions
    (i) $\log x - 2 \log x$,  
     (ii) $\log x^2 - \log x^5$,  
     (iii) $\log x^2 - \log y^2$,  
     (iv) $\log p/q + \log q/p$.

11. Solve the following equations for $x$.
    (i) $\ln x = 4$,  
     (ii) $\ln(2x - 1) = 4$,  
     (iii) $\ln 2x - 1 = 4$. 