Mathematica Assignment 3 : Worksheet  
Graphing Multiple Functions

Names (hand in one answer sheet and print out per team):

2. Make a rough sketch showing both the functions $y = e^x$ and $y = e^{-x}$ in the same picture. Label which function is which.

4. Did your rough sketch agree with what Mathematica drew? If not, explain what your error was and correct it by drawing another picture. Do not change your original picture.

5. Look at the graphs of $y = e^x$, $y = e^{-x}$ and by hand make a rough sketch showing the graph of $y = e^x + e^{-x}$. Hint: think of adding the two graphs together.
7. Did your rough sketch of \( y = e^x + e^{-x} \) agree with what Mathematica drew? If not, explain what your error was and correct it by drawing another picture. Do not change your original picture.

8. Look at the graphs of \( y = e^x \), \( y = e^{-x} \) and by hand make a rough sketch showing the graph of \( y = e^x - e^{-x} \). Hint: think of subtracting one graph from the other.

10. Did your rough sketch of \( y = e^x - e^{-x} \) agree with what Mathematica drew? If not, explain what your error was and correct it by drawing another picture. Still keep your original picture too.
11. Using the above definitions of \( \cosh(x) \) and \( \sinh(x) \), calculate by hand the derivatives of \( \cosh(x) \) and \( \sinh(x) \). Are your results in some way analogous to what happens with the derivatives of \( \cos(x) \) and \( \sin(x) \)?

12. Again using the definitions of \( \sinh(x) \) and \( \cosh(x) \), can you find some relation involving \( \cosh^2(x) \) and \( \sinh^2(x) \) that would be the analog of \( \sin^2(x) + \cos^2(x) = 1 \)?

14. (Worksheet) Does Mathematica's result agree with the result you got by hand in (11)? If not, double check your calculation, explain what the error was and redo it correctly.