## Math 205

## Assignment \#4

Due: February 6, 2015

1. A telephone cable hangs between two poles that are 14 m apart and has the shape of a catenary curve given by the equation $y=20 \cosh (x / 20)-15$ where $x$ and $y$ are measured in meters. Sketch the graph of this, putting the lowest point of the curve at $x=0$ and find the slope that the cable makes where it meets the pole on the right side. How much does the cable sag? ( $\mathbf{5}$ marks)
2. Use the exponential form of $\sinh (\mathrm{x})$ and $\cosh (\mathrm{x})$ to help prove the identity $\sinh (x+y)=\sinh (x) \cosh (y)+\sinh (y) \cosh (x)(5$ marks)
3. Question \#8, pg 167 from the $6^{\text {th }}$ edition of your text - Hughes-Hallett or HH (3 marks)
4. Question \#27, pg 168 from the $6^{\text {th }}$ edition of HH ( 5 marks)
5. Complete the following integrals taken from pg 360 in HH. Do NOT use integral tables or online tools but be sure to show the steps and substitutions that you used:
a. \#18 (3 marks)
b. \#26 (3 marks)
c. \#30 (3 marks)
d. \#46 (3 marks)
