

**MATH 2200 Fall 2002**  
**Homework 8**

Below is a list of selected problems from Edwards & Penny. It is in your best interest to work all of the problems. All problems from the homework are fair game on exams! ***Please staple your work.*** I will be available during office hours for help or by email. Homework is due Wednesday October 23, 2002 at 9:05am.

§ 3.7 1,3,5,9,13,16,22,41,43,51,56,72,74,77

§ 3.8 1,3,5,9,17,20,24,33,60

$\alpha$ ) Let

$$f(x) = \frac{e^x + e^{-x}}{2} \text{ and } g(x) = \frac{e^x - e^{-x}}{2}.$$

Prove that  $f'(x) = g(x)$  and  $g'(x) = f(x)$ . (For the record,  $f(x) = \cosh(x)$  and  $g(x) = \sinh(x)$ , the hyperbolic cosine and hyperbolic sine.)

$\beta$ ) The light in an offshore lighthouse is rotating at a constant rate. Show that, as the beam of light moves down the shoreline, it moves most slowly at the point on the shore directly opposite the lighthouse.

**I will grade problems 22 from section 3.7, 24 from section 3.8,  $\alpha$ , and  $\beta$ . As always, up to 10 points will be awarded according to the amount of problems completed.**