Homework problems due on Wednesday Nov. 23, 2011.
Do problems 3.15, 17 from the book and the following exercises:

1. Given a surface of revolution \( \sigma_1 (r, \theta) = (r \cos \theta, r \sin \theta, z_1 (r)) \) show that there is a function \( z_2 (r) \) so that \( \sigma_1 \) becomes conformal to the cylinder \( \sigma_2 (r, \theta) = (\cos \theta, \sin \theta, z_2 (r)) \).

2. Given a surface of revolution \( \sigma_1 (r, \theta) = (r \cos \theta, r \sin \theta, z_1 (r)) \) show that there a function \( z_2 (r) \) so that \( \sigma_1 \) becomes equiareal to the cylinder \( \sigma_2 (r, \theta) = (\cos \theta, \sin \theta, z_2 (r)) \).

3. Compute the mean curvature of the Enneper surface:

\[
 f (u, v) = \left( u - \frac{1}{3} u^3 + uv^2, -v + \frac{1}{3} v^3 - vu^2, u^2 - v^2 \right)
\]

Scherk minimal surface:

\[
 f (u, v) = \left( u, v, \log \frac{\cos v}{\cos u} \right)
\]

and Catalan surface:

\[
 f (u, v) = \left( u - \sin u \cosh v, 1 - \cos u \cosh v, 4 \sin \frac{u}{2} \sinh \frac{v}{2} \right)
\]

See also page 113 in the book.