

This problem set is shorter – I am just trying to make sure you are keeping up with what's happening in lecture. I will pass out the take-home prelim on Tuesday. Please write up solutions to the following problems.

1. Calculate the first fundamental forms of the following surfaces:
  - a.  $\sigma(u, v) = (u - v, u + v, u^2 + v^2)$ ;
  - b.  $\sigma(u, v) = (u, v, u^2 + v^2)$ ;
  - c.  $\sigma(u, v) = (u \cos(v), u \sin(v), u^2)$ ; and
  - d.  $\sigma(u, v) = ((a + b \cos(u)) \cos(v), (a + b \cos(u)) \sin(v), b \sin(u))$  ( $0 < b < a$ ).
2. Please do problem 5.4 in §5.1.
3. Please do problems 5.9 and 5.11 in §5.3.
4. Please do problem 5.15 in §5.4.