Vector Analysis

Spring 2014

Ex Tempore 6

Wed 26.3.

1. S is a surface on the xy-plane, bounded by the straight lines

$$x-2y=0,\quad x-2y=-4,$$
$$x+y=4,\quad x+y=1.$$

Make a change of variables so that the integration area becomes a rectangle. Determine the Jacobi determinant.

2. Evaluate $\iint_S dS\ 9x$, where S is the surface of the problem 1.

3. Calculate $\iint_S dS\ x^2yz,$ where S is the part of the surface $z=1+2x+3y$, that is above the (x,y)-plane rectangle $[0,3]\times[0,2]$.