Homework Comments Key
Math 53, Sections 105 and 106

Assignment 1

(1) Need to explain computations more carefully.

(2) Need to show more detailed or more rigorous work.

(3) Need to give a citation.

(4) Derivatives are not always defined, and may be either infinite or undefined. In such cases, need to look at the limits of nearby derivatives in order to determine which.

(5) Need to solve analytically.

(6) The slope of a polar function is described by $\frac{\mathrm{d}y}{\mathrm{d}x}$, not $\frac{\mathrm{d}r}{\mathrm{d}\theta}$.

(7) Areas can only be positive. Make sure to sanity-test your solutions.

Assignment 2

(8) Need to cite previous exercise in order to apply the midpoint formula.

(9) Need to explain computations more carefully.

Assignment 3

(10) Need to explain computations more carefully.

(11) See Dr. Fitzpatrick's solutions for an easier approach.

Assignment 4

(12) Contour maps should be drawn to scale, and with specifically labeled level curves.

(13) The problem asks for a comparison between the contour map and the graph.

(14) The graph should only consist of the top half of an ellipsoid.

(15) The graph should be neatly drawn, with key points labeled.

(16) The contour map needs to be drawn in more detail.

(17) A function f is said to be discontinuous on a curve if f is discontinuous at every point on that curve.

(18) Need to argue using limits.

(19) Need to explain computations more carefully.

(20) Need to use the basic definition of a partial derivative.

Assignment 5

Assignment 6

(21) As stated, the work does not present a complete argument.

(22) Need to explain computations in greater detail.

(23) Need to cite Equation 9 from Stewart's Section 15.1.

(24) The role that symmetry plays in this problem is that the 2nd and 3rd terms in the integral don't contribute anything because they are odd in one of their variables, and the domain of the integral is symmetric with respect to reflection across by the x- and y-axes.

Assignment 7

(25) Need to use a limit to compute this improper integral.

(26) Need to explain computations in greater detail.

Assignment 8

(27) Need to explain computations in greater detail.

(28) Notice that the integrand is non-negative on the domain of integration. This immediately indicates that the integral should evaluate to a non-negative number.

Assignment 9

(29) Need to sketch several flow lines of the vector field.

(30) Vectors in a vector field should be drawn carefully, and approximately to scale. In particular, the direction and magnitude of vectors should be reflected in the sketch, fairly uniformly across the domain of the sketch.

Assignment 10

(31) A specification for a parametric curve should specify the proper orientation, since a starting point and direction are part of the information of the parametrization.

Assignment 11

(32) Need to include the two planar surfaces at either end of the cylinder.

Assignment 12

(33) Can't use Stokes' Theorem in a problem which asks you to demonstrate that Stokes' Theorem is true.

(34) Need to take into account the other face of the solid when applying the Divergence Theorem.

(35) Need to argue that the area of the surface is proportional to the area of the projection in the xy-plane.