Spring 2002 Math 280 **HW assignments**

HW 1
p. 82 no. 1, 2 ab, 3 ad, 4, 7

HW 2
p. 89 no. 1abf, 4bde, 5b, 6
p. 96 no. 1 acd, 2b, 3ad, 4

HW 3
p. 100 no. 2, 3, 4, 7, 10ac, 11
p. 105 no. 1bc, 2a, 4, 5

HW 4
p. 118 no. 1a, 3a, 4, 6b, 8b
(P1) Equations

$$y \cos x + uv^2 = 0$$

$$x^3 + y + u \ln v - 1 = 0$$

are satisfied at the point $P^0 = (1, 0, 0, 1)$.

a) Explain why two of the variables can be viewed as functions of the rest of the variables. Discuss all possible choices!

b) For your favorite choice of variables that are functions of the rest of the variables find their total differentials at P^0.

p.122 no. 1, 3, 4, 6a

HW 5
p.129 no. 1, 2, 8bc, 9, 10 bd, 12, 15

HW 6
p. 138 no. 1ad, 2b, 3, 8, 9
p. 146 no. 1, 2a, 3c, 4b, 10, 11, 12a

HW 7
p. 163 no. 4abcg, 5a, 6cd, 7, 8bc
(P1) Find 3 real numbers whose sum is 9 and the sum of whose squares is as small as possible.
(P2) Find the extreme values of $f(x, y, z) = x^2yz + 1$ on the intersection of the plane $z = 1$ with the sphere $x^2 + y^2 + z^2 = 10$.

HW 8
p. 186 no. 1bc, 6, 7

p. 191 no. 1, 3, 5a, 6

HW 9
p. 244 no. 1abc, 2bd, 3, 4, 5b, 6ab, 10b, 11a
(E1) Let R be a closed region bounded by $y = x^3,\ y = 1,\ x = 0$. Find the moment of inertia I_y (about the y-axis) of a thin plate covering R, if the density function is given by xye^{x^2}.
p. 252 no. 4c, 5, 6, 11, 12

HW 10
p. 259 no. 1, 2
p. 290 no. 1, 2, 3b, 4, 5
(P1) Let C be the curve given by $x = \cos t + t\sin t,\ y = \sin t - t\cos t$ where $0 \leq t \leq 2\pi$. Evaluate

$$\int_C \sqrt{x^2 + y^2}ds$$

(P2) Let C be the curve given by $x = t - \sin t,\ y = 1 - \cos t$ where $0 \leq t \leq 2\pi$. Evaluate

$$\int_C (2 - y)dx + (y - 1)dy$$

HW 11
p. 298 no. 1, 2ac, 3, 5bcde, 6
(P1) Evaluate

$$\int_C (x + y)^2 dx - (x^2 + y^2)dy$$

where C is the boundary of triangle with vertices (1,1), (3,2), (2,5).
(P2)Evaluate

$$\int_C e^x((1 - \cos y)dx + (\sin y - y)dy)$$

where C is the boundary of the region $0 < x < \pi,\ 0 < y < \sin x$.

HW 12 (Due Friday, April 26)
p. 313 no. 1ab, 2bd, 3cd, 6, 7, 10, 11a
p. 326 no. 1bce, 2, 3ab, 5bcd, 6bcd, 7abc

HW 13
p.333 no. 1bce, 4abc
p.344 no. 1, 2, 3, 5, 7
(P1) Using Gauss Theorem evaluate

$$\int\int_S zdxdy + (5x + y)dydz$$

where S is the boundary of

a) the cone $x^2 + y^2 \leq z^2,\ 0 \leq z \leq 4$

b) the ellipsoid $\dfrac{x^2}{4} + \dfrac{y^2}{9} + z^2 = 1$

(P2) Using Stoke's Theorem evaluate

$$\int_C (x+z)dx + (x-y)dy + xdz$$

where C is the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1,\ z = c$ oriented positively with respect to the vector $\vec{n} = (0, 0, 1)$.