Answer's to Math 241 Final, 1992

Part I:

(1) (a) 11
(b) -4

(2) (a) $(r, \theta, z) = (4, 4\pi/3, 4)$
(b) $(\rho, \phi, \theta) = (4\sqrt{2}, \pi/4, 4\pi/3)$

(3) (a) $\pi^2/2$
(b) 2

(4) $9\pi/2$

(5) does not exist

(6) Abs. Min. is -1
(No Abs. Max.)

(7) $2/7$

(8) (a) $2\sqrt{3}$
(b) $x + y + z = 2$

(9) (a) (f), $(0, \pm 1/\sqrt{3}, 0)$
(b) (b), 0, 1/3, and 0

(10) -10

Part II:

(1) 81

(2) Saddle Point at $(0, 0, 3)$
Local Min. at both of $(1, -1, 0)$ and $(-1, 1, 0)$

(3) 8π

(4) $\dfrac{81\pi}{2}\left(1 - \dfrac{\sqrt{6}}{3}\right)$

(5) 2