HW # 8
Graded problem

Section 13.8 # 38

$f(x,y) = x^3 + y^3 - 6x^2 + 9y^2 + 12x + 27y + 19$

(a) $f_x = 3x^2 - 12x + 12 = 0$

$f_y = 3y^2 + 18y + 27 = 0$

$\Rightarrow x = 2,\ y = -3$

(b) $f_{xx} = 6x - 12$

$f_{yy} = 6y + 18$

$f_{xy} = 0$

At $(2,-3)$, $f_{xx} f_{yy} - (f_{xy})^2 = 0$.

$(2,-3,0)$ is a sadde point as $f(x,y) \geq 0$ or $f(x,y) \leq 0$ can be

(c) Test fails at $(2,-3)$

Hw #9

Section 14.1 #70

$$\int_0^2 \int_x^2 e^{-y^2}\,dy\,dx = \int_0^2 \int_0^y e^{-y^2}\,dx\,dy = \int_0^2 \left[x\,e^{-y^2}\Big|_0^y\right] dy =$$

$$= \int_0^2 y e^{-y^2}\,dy = \left[-\frac{1}{2}e^{-y^2}\right]_0^2 = -\frac{1}{2}\left(e^{-4}\right) + \frac{1}{2}e^0 =$$

$$= \frac{1}{2}\left(1 - e^{-4}\right)$$