MTH 255 **HW #8** Winter 2003

Skills check (not to turn in):
§16.9: 14

Assigned:

1. Suppose $\vec{\nabla} \cdot \vec{\boldsymbol{F}} = xyz^2$.

(a) Find $\vec{\nabla} \cdot \vec{\boldsymbol{F}}$ at the point $(1, 2, 1)$.
Note: You are given $\vec{\nabla} \cdot \vec{\boldsymbol{F}}$, not $\vec{\boldsymbol{F}}$!

(b) Using your answer to part (a), but no other information about the vector field $\vec{\boldsymbol{F}}$, estimate the flux out of a small box of side 0.2 centered at the point $(1, 2, 1)$ and with edges parallel to the axes.

(c) Without computing the vector field $\vec{\boldsymbol{F}}$, calculate the exact flux out of the box.

2. §16.9: 22
Suggestion: Use the standard rectangular basis vectors $\hat{\boldsymbol{\imath}}$, $\hat{\boldsymbol{\jmath}}$, $\hat{\boldsymbol{k}}$.