MTH 255 **HW #3** Spring 2003

Skills check (not to turn in):

(a) §16.1: 3, 11, 13, 15, 17

(b) §16.2: 3, 17

Assigned:

1. Consider a valley whose height h in meters is given by $h = \frac{x^2}{10} + \frac{y^2}{10}$, with x and y (and 10!) in meters. Suppose you are hiking through this valley on a trail given by

$$x = 3t \qquad y = 2t^2$$

with t in seconds (and where "3" and "2" have appropriate units).

(a) How fast are you climbing (rate of change of h) *per meter* along the trail when $t = 1$? *You may find it helpful to recall that* $ds = |d\vec{\boldsymbol{r}}|$.

(b) How fast are you climbing *per second* when $t = 1$.

2.

(a) For each vector field $\vec{\boldsymbol{F}}$ shown below, sketch a curve for which the integral $\int_C \vec{\boldsymbol{F}} \cdot d\vec{\boldsymbol{r}}$ is positive.

(b) For which of these vector fields is it possible to choose your curve to be closed?