KFUPM.....Math & Stats Dept ....Math 301-02 (123) ... Quiz #1
ID:..... Name:.....

Exercise #1:
(a) Find the unit tangent vector u to the graph of $x^2 + \sin y = 1$ at $(1, 0)$
(b) Find the directional derivative of $f(x, y) = xy^2 + 3y \sin x$ at $(\frac{\pi}{2}, 1)$ in the direction of the vector $u =< 1, 2 >$.
(c) Find the direction of the minimum rate of change of $f(x, y)$ at $(\frac{\pi}{2}, 1)$.

Exercise #2: Find the length of the curve traced by
$r(t) = (\sin t)\mathbf{i} + (\cos t)\mathbf{j} + t\mathbf{k}$ when $0 \leq t \leq \pi$.