Calc 3 - Assignment (Line Integrals)

Note Title 11/15/2011

(1) Evaluate the line integrals for the given curve C:

a) $\int_C y^3 \, ds$, $C: x = t^3, y = t$, $t \in [0, 2]$

b) $\int_C x \sin(y) \, ds$, C is the line segment from $(0, 3]$ to $(4, 6]$

c) $\int_C 3x^2 + 3y^2 \, ds$, C is upper circle, radius 2

(2) Find the potential function, if possible, for:

a) $\vec{F}(x, y) = \langle x^3 y^4, x^4 y^3 \rangle$

b) $\vec{F}(x, y) = \left\langle \frac{y^2}{1 + x^2}, 2y \arctan(x) \right\rangle$

c) $\vec{F}(x, y, z) = \langle yz, xz, xy + 2z \rangle$

d) $\vec{F}(x, y, z) = \langle 2xz + y^2, 2xy, x^2 + 3z^2 \rangle$