Math 3202 **Due Tue March 15** **Assignment #6**

1. Evaluate the line integral along given curve
   (a) $\int ye^x\,ds$, along the line segment jointing $(1,2)$ to $(4,7)$.
   (b) $\int(xy+\ln x)\,dy$, along the arc of the parabola $y=x^2$ from $(1,1)$ to $(3,9)$.
   (c) $\int x^2z\,ds$, along the line segment jointing $(0,6,-1)$ to $(4,1,5)$.
   (d) $\int(2x+9z)\,ds$, along the arc $x=t$, $y=t^2$, $z=t^3$, $0\le t\le 1$.
   (e) $\int z\,dx+x\,dy+y\,dz$, along the arc $x=t^2$, $y=t^3$, $z=t^3$, $0\le t\le 1$.
2. Evaluate the line integral $\int_C \vec{F}\cdot d\vec{r}$, where $\vec{F}=(yz,xz,xy)$ and $\vec{r}=(t,t^2,t^3)$.
3. Determine whether or not $\vec{F}$ is a concervative vector field. If it is, find its potential function $f(x,y)$.
   (a) $\vec{F}=(x^3+4xy,4xy-y^3)$
   (b) $\vec{F}=(e^y,xe^y)$
4. Evaluate the line integral $\int_C \vec{F}\cdot d\vec{r}$, where $\vec{F}=(y,x+2y)$ along a smooth curve that starts at $(0,1)$ and ends at $(2,1)$. Hint: use the Fundamental Theorem of Calculus.