FTLI:

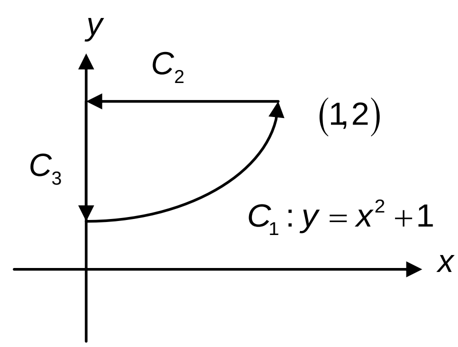
1. $\bar{F}(x,y)=\langle 4x^3y^2-2xy^3, 2x^4y-3x^2y^2+4y^3\rangle$ with $\bar{r}(t)=\langle t+\sin\pi t, 2t+\cos\pi t\rangle$ where $0\le t\le 1$

2. $\bar{F}(x,y)=\left\langle -\frac{1}{2}y^2+y\ln xy, x\ln xy-xy\right\rangle$ with $\bar{r}(t)=\left\langle t^2+1,\cos\frac{\pi}{4}t\right\rangle$ where $0\le t\le 1$

3. $\bar{F}(x,y,z)=\left\langle 2xyz^3+\frac{1}{y}-\frac{z}{x}+3x^2, x^2y^3-\frac{x}{y^2}+2yz-2y, 3x^2yz^2-\ln x+y^2+\frac{1}{z}\right\rangle$ from $(1,1,1)$ to $(3,2,1)$

Green's Thm:

1. Evaluate $\oint_C \frac{x}{y}dx+x^2dy$ over $C=C_1\cup C_2\cup C_3$ two ways with:



2. Evaluate $\oint_C \left(e^{x^2}+y\right)dx+\left(x^2+\tan^{-1}\sqrt{y}\right)dy$ over C where C is the rectangle with vertices $(1,2)$, $(1,4)$, $(5,2)$, and $(5,4)$

3. Determine the area of the ellipse whose curve is described by $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

Surface Integrals of *f* over a surface S:

1. Determine the surface area, in two ways, of the boundary of the solid determined by the surfaces whose equations are:

$$z^2=x^2+y^2 \text{ and } z=1$$

2. Evaluate the surface integral $\iint_S x^2 z dS$ with a surface S bounding the solid within the graphs of the following equations: $x^2 + y^2 = 1, z = 1,$ and $z = 4$

3. Determine the surface area of the portion of the sphere whose center is at the origin and whose radius is 3 that resides in the first octant.