This quiz is due by 4pm on Tuesday, November 24, 2015. You may turn this in during class or at my office.

For this assignment, if you want you may do the following: Set up the integral in the parametrized form and then use some technology to compute the actual integral.

1. Evaluate $\int_C x^2yz \, ds$, where $C$ is the line segment from $(0, 1, 1)$ to $(3, 0, 6)$.

   $\mathbf{r}(t) = (1-t)\langle 0,1,1 \rangle + t \langle 3,0,6 \rangle = \langle 3t, 1-t, 1+5t \rangle$

   $x = 3t \quad dx = 3 \, dt$

   $y = 1-t \quad dy = - \, dt$

   $z = 1+5t \quad dz = 5 \, dt$

   $ds = \sqrt{3^2 + (-1)^2 + 5^2} \, dt = \sqrt{35} \, dt$

   $\int_0^1 (3t)^2 \cdot (1-t)(1+5t) \sqrt{35} \, dt = \ldots = 3 \sqrt{35}$

2. Evaluate $\int_C y \, dx + (3x^2 + y) \, dy$, where $C$ is the curve consisting of the line segment from the point $(0, 1)$ to the point $(3, 0)$ and then the arc of the curve $y = 9 - x^2$ from the point $(3, 0)$ to $(0, 9)$.

   $\mathbf{r}_1(t) = (1-t)\langle 0,1 \rangle + t \langle 3,0 \rangle = \langle 3t, 1-t \rangle$

   $\int_0^1 (1-t) \, 3 + \left[ 3(3t)^2 + 1-t \right] \cdot (-1) \, dt = \ldots = -8$

   $\mathbf{r}_2(\theta) = \langle 3 \cos \theta, 9 - 3 \cos^2 \theta \rangle$

   $y = 9 - x^2 \quad note \ this \ is \ Backwards.$

   $dy = -2x \, dx$

   $\int_0^\pi (9 - x^2) + (3x^2 + 9 - x^2)(-2x) \, dx = \ldots = 144$

Answer: $-8 + 144 = 136$