Section 16.2: Additional Problems

1. Evaluate $\int_C x^2yzds$, where C is the line segment from $(1, 0, 2)$ to $(4, 3, 0)$.
2. Evaluate $\int_C ydx + (3x^2 + y)dy$, where C is the curve consisting of the the arc of the curve $y = 9 + x^3$ from the point $(-1, 8)$ to $(2, 17)$ and then the line segment from the point $(2, 17)$ to the point $(4, 0)$
3. Evaluate $\oint_C (x + y)dx + (2x + y)dy$, where C is the path from the point $(0, 0)$ to $(6, 0)$ to $(0, 10)$
4. A thin wire with linear density $\rho(x, y) = 2 + x^2y$ takes the shape of the semicircle $x^2 + y^2 = 4$, $y \geq 0$. Find the center of mass for this wire.