

18.022 Recitation Handout
13 November 2014

1. (5.5.10 in *Colley*) Evaluate the integral $\int_0^2 \int_{x/2}^{x/2+1} x^5(2y-x)e^{(2y-x)^2} dy dx$ by making the substitution $u = x$ and $v = 2y - x$.

2. Let D be a parallelogram with vertices $(0,0)$, $(1,0)$, $(1,1)$, and $(2,1)$. Calculate $\iint_D 1 dA$ in two ways:

(a) Find $\iint_D 1 dA$ without using calculus.

(b) Find $\iint_D 1 dA$ using the change of variables $u = 2x - 2y$ and $v = 2y$.

3. (5.5.30 in *Colley*) Find the volume of the solid that is bounded by the paraboloid $z = 9 - x^2 - y^2$, the xy -plane, and the cylinder $x^2 + y^2 = 4$.

4. (5.5.29 in *Colley*) Find the volume of the region W that represents the intersection of the solid cylinder $x^2 + y^2 \leq 1$ and the solid ellipsoid $2(x^2 + y^2) + z^2 \leq 10$.