NAME: (print!) ___Fady Besada___ **Section:** _22_

1. Compute the Jacobian of the transfomation

$$\Phi(r,s) = (rs, r+s)$$

$$\to J = (s)(1) - (r)(1) = \boxed{s-r}$$

2. Let $\mathcal{D} = \Phi(\mathcal{R})$ where $\Phi(u,v) = (u+v, v^2)$ and $R = [0,6] \times [1,2]$. Calculate

$$\int\int_{\mathcal{D}} y\, dA \quad .$$

(Note: it is not necessary to compute D).

$$\to J = (1)(2v) - (1)(0) = 2v$$

$$\to \int\int_R 2v^3 \, dA$$

$$\to \int_0^6 \int_1^2 2v^3 \, dv \, du = \boxed{45}$$