1. Change the order of integration by first sketching the region of integration. Then evaluate your integral, if possible.

   (a) $\displaystyle \int_0^\pi \int_x^\pi \frac{\sin y}{y}\, dy dx$

   (b) $\displaystyle \int_0^9 \int_{-3}^{-\sqrt{y}} f(x,y)\, dx dy$

2. Use a double integral to setup an integral which represents the area of the region bounded by $y = (x-1)^2$, $y = (x+1)^2$, and $y = 0$. (*Sketch the region!*)

3. Use a double integral to setup an integral which represents the volume of the solid that lies below the surface $x + y + z = 1$ and above the region bounded by $x = 0$, $y = 0$, and $x + y = 1$. (*Sketch the region!*)

4. Use a double integral to setup an integral which represents the volume of the solid that lies inside the sphere $x^2 + y^2 + z^2 = 2$ and above the paraboloid $z = x^2 + y^2$ (*Sketch the region!*). Evaluate your integral.