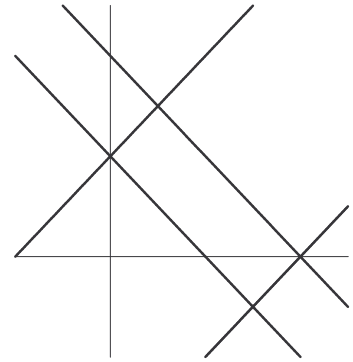




3. (10 points) Compute  $\iint (x+y) dx dy$  over the region bounded by the lines  $y = x - 2$ ,  $y = x + 1$ ,  $y = 1 - x$ , and  $y = 2 - x$ .

Use curvilinear coordinates.

Half credit for rectangular coordinates.



4. (10 points) The temperature in a box is  $T = 100xyz^\circ\text{C}$ . A wire temperature probe has the shape of the curve  $\vec{r}(t) = \left(t, t^2, \frac{2}{3}t^3\right)$  for  $0 \leq t \leq 1$ . Find the average temperature along the probe given by  $T_{\text{ave}} = \frac{\int T ds}{\int ds}$ . HINT: Factor inside the square root.