Q1 Evaluate

a) $\displaystyle\int_{0}^{1}\int_{0}^{1} \frac{y}{x^2 y^2 + 1}\,dy\,dx$

b) $\displaystyle\int_{-1}^{0} \int_{-\sqrt{1-x^2}}^{0} \frac{2}{1+\sqrt{x^2+y^2}}\,dy\,dx$

Q3 Find the volume of the region bounded above by $z = x^2 + y^2$ and below by the triangle enclosed by the lines $y = x$, $x = 0$, and $x + y = 2$ in the xy-palne