97. Let $X_1, ..., X_n$ be a random sample from an exponential(θ) population. Let $X_{(1)} < X_{(2)} < ... < X_{(n)}$ represent the order statistics of the sample. Define the sample range R = $X_{(n)} - X_{(1)}$ and the mid-range V = $(X_{(1)} + X_{(n)})/2$

(a) Find the joint distribution of $X_{(1)}$ and $X_{(n)}$.

(b) Use bivariate transformation methods to find the joint distribution of (R, V).

(c) Find expressions for the marginals of R and V.