More continuous distributions practice

1. The proportion of impurities in certain ore samples is a random variable Y with a pdf given by $f_Y(y) = \frac{3}{2}y^2 + y$ when $0 \le y \le 1$, and 0 otherwise. The dollar value of the corresponding ore samples is the random variable $U = 5 - \frac{1}{2}Y$. Find the probability density function for U.

- Let X₁, X₂, ..., X_n be iid exponential RVs with common mean β, and Y=min(X₁, X₂, ..., X_n).
 a. What is the distribution of Y?
 - b. What is the expected value of Y?
 - c. Calculate P(Y < 4) when n=8 and β =3.

- 3. Let *X* and *Y* be jointly continuous RVs with pdf given by $f(x,y) = 2e^{-(x+y)}$ for $0 \le x \le y \le \infty$, and 0 otherwise.
 - a. Find the cumulative probability F(5,3).

b. Find P(X>3, Y>6).

c. Find P(Y > 3X).

d. Find P($X+Y \leq 10$).

e. Find the marginal pdf of *Y*.