1- The number of minutes that a flight from Ankara to İstanbul is early or late is a random variable whose probability density is given by

$$f(x) = \begin{cases} (36-x^2)/288 & \text{for } -6 < x < 6 \\ 0 & \text{elsewhere} \end{cases}$$

where negative values are indicative of the flight's being early and positive values are indicative of its being late. Find the probabilities that one of these flights will be

a) at most 2 minutes early;
b) at least 1 minute late;
c) exactly 5 minutes late.

2- If two cards are randomly drawn (without replacement) from an ordinary deck of 52 playing cards. **z** is the number of aces obtained in the first draw and **w** is the total number of aces obtained in both draws, find

a) The joint probability density function of **z** and **w** , f (z,w) = ?
b) The marginal density of **z**, g(z) = ?
c) The conditional density of **w** given **z = 1.**

3- The amount of time (in minutes) that an executive of a certain firm talks on the telephone is a random variable having the probability density, find the expected length of one of these telephone conversations that has lasted at least **1** minute.

$$f(x) = \begin{cases} \boldsymbol{x} / 4 & \text{for } 0 < \boldsymbol{x} \leq 2 \\ 4 / \boldsymbol{x}^3 & \text{for } \boldsymbol{x} > 2 \\ 0 & \text{elsewhere} \end{cases}$$