ECO239 HW Questions for Chapter 5 Continuous Probability Distribution – part 1-

Q1. Given X~U(0, 2),

a. Draw the probability density function.
b. Find the probability that the random variable X is between 1.4 and 1.8
c. Find the probability that the random variable X is between 1.0 and 1.9.
d. Find the probability that the random variable X is less than 1.4.
e. Find the probability that the random variable X is greater than 1.3.

Q2. The jurisdiction of a rescue team includes emergencies occurring on a stretch of river that is 4 miles long. Experience has shown that the distance along this stretch, measured in miles from its northernmost point, at which an emergency occurs can be represented by a uniformly distributed random variable over the range 0 and 4 miles. Then, if X denotes the distance 9in miles) of an emergency from the northernmost part of this stretch of river, its probability density function is $f(x) = \begin{cases} 0.25 & for\ 0 < x < 4 \\ 0 & for\ all\ other\ x \end{cases}$

a. Draw the probability density function.
b. Find and draw the cumulative distribution function.
c. Find the probability that a given emergency arises within 1 mile of the northernmost point of this stretch of river.
d. The rescue team's base is at the midpoint of this stretches of river. Find the probability that a given emergency arises more than 1.5 miles from this base.

Q3. The incomes of all families in a particular suburb can be represented by a continuous random variable. It is known that the median income for all families in this suburb is $60,000 and that 40% of all families in the suburb have incomes above $72,000.

a. For a randomly chosen family, what is the probability that its income will be between $60,000 and $72,000?
b. Given no further information, what can be said about the probability that a randomly chosen family has an income below $65,000?