## CS 333202: Probability and Statistics HW3 Part I

1. $F$, the distribution function of a random variable $X$, is given by

$$
F(t)= \begin{cases}0 & t<-1 \\ (1 / 4) t+1 / 4 & -1 \leq t<0 \\ 1 / 2 & 0 \leq t<1 \\ (1 / 12) t+7 / 12 & 1 \leq t<2 \\ 1 & t \geq 2\end{cases}
$$

Calculate the following quantities: $P(X<1), P(X=1)$, $P(1 \leq X<2), P(X>1 / 2), P(X=3 / 2)$, and $P(1<X \leq 6)$
2. Airline $A$ has commuter flights every 45 minutes from San Francisco airport to Fresno. A passenger who wants to take one of these flights arrives at the airport at a random time. Suppose that $X$ is the waiting time for this passenger; find the distribution function of $X$. Assume that seats are always available for these flights.
3. In a small town there are 40 taxis, numbered 1 to 40 . Three taxis arrive at random at a station to pick up passengers. What is the probability that the number of at least one of the taxis is less than 5 ?

