## CS 333202: Probability and Statistics HW8 Part II

1. If $X$ is a normal random variable with parameters $\mu=10$ and $\sigma^{2}=36$, compute
(a) $P\{X>5\}$
(b) $P\{4<X<16\}$
(c) $P\{X<8\}$
(d) $P\{X<20\}$
(e) $P\{X>16\}$
2. To be a winner in the following game, you must be successful in three successive rounds. The game depends on the value of $U$, a uniform random variable on $(0,1)$. If $U>0.1$, then you are successful in round 1 ; if $U>0.2$, then you are successful in round 2 ; and if $U>0.3$, then you are successful in round 3 .
(a) Find the probability that you are successful in round 1.
(b) Find the conditional probability that you are successful in round 2 given that you were successful in round 1 .
(c) Find the conditional probability that you are successful in round 3 given that you were successful in round 1 and 2.
(d) Find the probability that you are a winner.
3. A point is selected at random on a line segment of length $\ell$.
(a) What is the probability that the longer segment is at least twice as long as the shorter segment?
(b) What is the probability that none of the two segments is smaller than $\ell / 3$ ?
