Homework assignment 7

1. Suppose $x \sim \mathcal{N}(20, 4)$ (That is, x is normally distributed with mean 20 and standard deviation 4), determine the following: $P[x > 20]$, $P[16 < x < 24]$, $P[x < 12]$, $P[x = 22]$, $P[12 < x < 28]$, and $P[x > 16]$.

2. Suppose $x \sim \mathcal{N}(25, 5)$ determine the following probabilities: $P[x > 25]$, $P[20 < x < 30]$, $P[x < 30]$, $P[x = 26.2]$, $P[15 < x < 25]$, and $P[x > 15]$.

3. In 2007, the average conventional first mortgage for new single-family homes was $360,000. Assuming a normal distribution and a standard deviation of $30,000, what proportion of the mortgages were:

   - more than $360,000?
   - between $300,000 and $420,000?
   - between $330,000 and $390,000?
   - more than $270,000?

4. It has been reported that the average hotel check-in time, from curbside to delivery of bags into the room, is 12.0 minutes. An Li has just left the cab that brought her to her hotel. Assuming a normal distribution with a standard deviation of 2.0 minutes, what is the probability that the time required for An Li and her bags to get to the room will be:

   - greater than 14.0 minutes?
   - between 10.0 and 14.0 minutes?
   - less than 8.0 minutes?
   - between 10.0 and 16.0 minutes?

5. MENSA is an organization whose members possess IQs in the top 2% of the population. If IQs are normally distributed, with mean 100 and a standard deviation of 16, what is the minimum IQ required for admission to MENSA?

6. Suppose the height , x, of adults in inches, is a normally distributed with mean 70. If $P[x > 79] = 0.025$ what is the standard deviation of this random normal variable?