

NAME _____

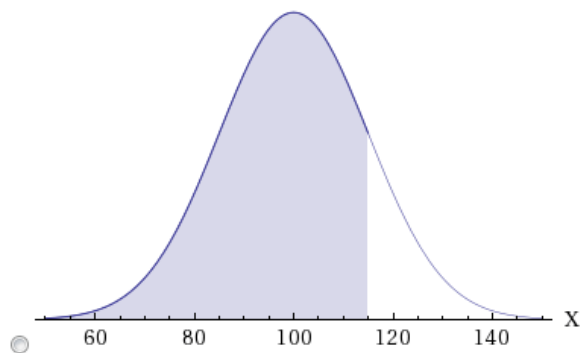
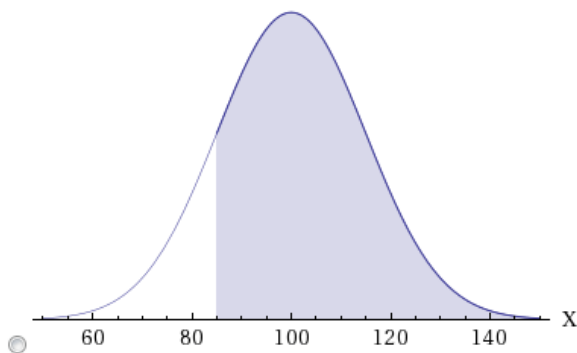
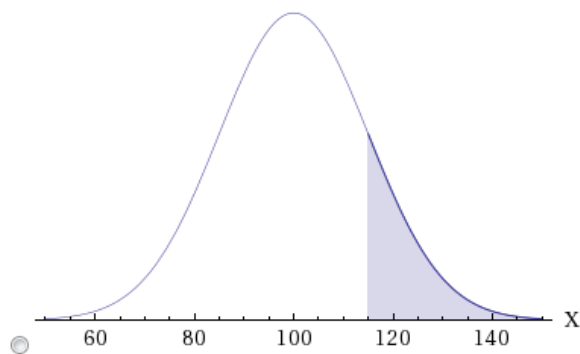
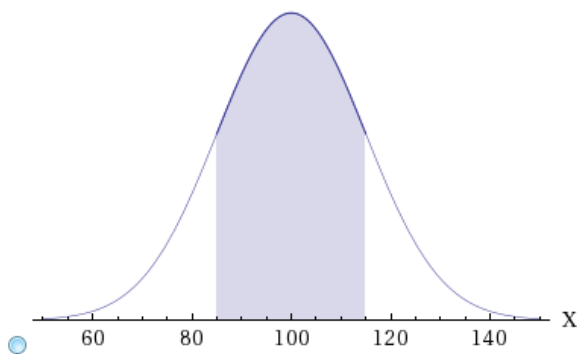
MAT 130 Homework #3 (Chapters 6-7)

DUE: October 14th

#1.) IQ is normally distributed with a mean of 100 and a standard deviation of 15. Suppose one individual is randomly chosen. Let X = IQ of an individual.

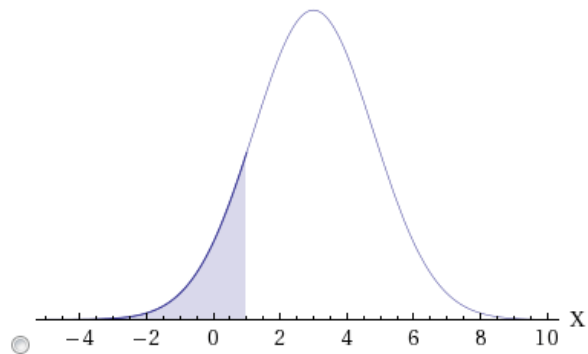
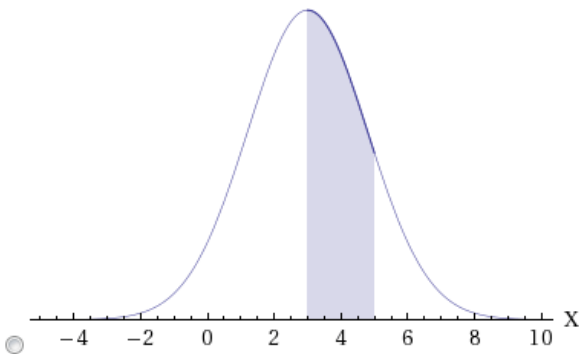
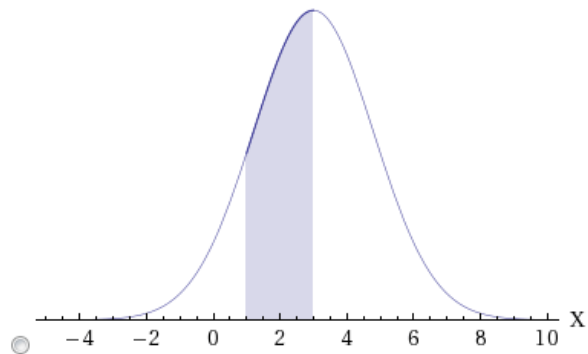
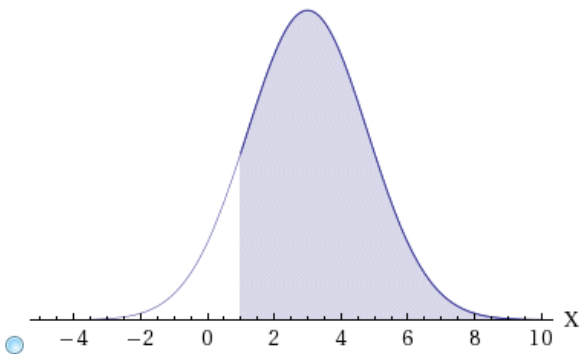
- a) Find the probability that the person has an IQ greater than 85. First write the probability statement and then give the probability (round your answer to four decimal places)

- b) Sketch the graph.



#2.) Suppose 4-year-olds in a certain country average 3 hours a day unsupervised and that most of the unsupervised children live in rural areas, considered safe. Suppose that the standard deviation is 1.6 hours and the amount of time spent alone is normally distributed. We randomly survey one 4-year-old living in a rural area. We are interested in the amount of time the child spends alone per day.

- a) In words, define the random variable X .
- b) Give the distribution of X .
- c) Write the probability statement that a child spends less than 1 hour per day unsupervised.
- d) What is the probability from part c? (Round your answer to four decimal places.)
- e) Pick the graph presenting the probability discussed in parts c and d.



f) What percent of the children spend over 6 hours per day unsupervised? (Round your answer to four decimal places.)

g) 80% of the children spend at least how long per day unsupervised? (Round your answer to two decimal places.)

#3.) Suppose that the duration of a particular type of criminal trial is known to be normally distributed with a mean of 21 days and a standard deviation of 5 days.

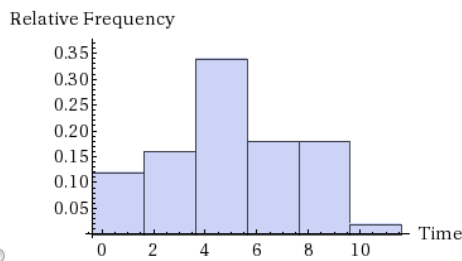
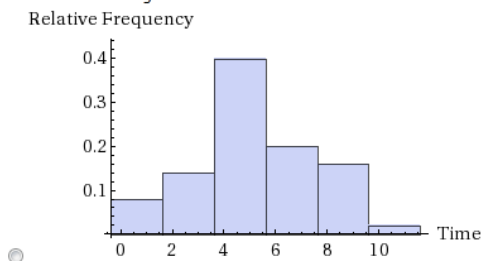
The middle 70% of all of these types of trials are completed within what time frame in terms of number of days? (Round your answer to two decimal places.)

#4.) A survey was conducted as to how long customers at a clothing store claimed to wait in the checkout line until their turn. Let X = time in line. Below are the ordered data (in minutes).

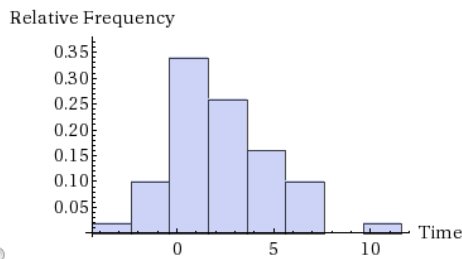
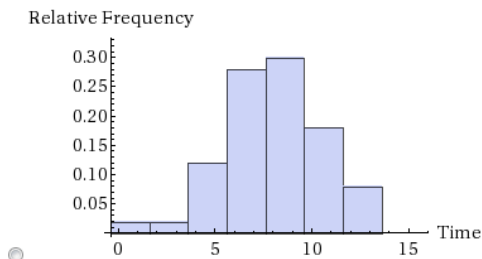
0.5	3.0	4.5	5.5	7.5
1.5	4.0	4.5	6.0	8.0
1.5	4.0	4.5	6.0	8.0
1.5	4.0	5.0	6.0	8.5
2.0	4.0	5.0	6.0	8.5
2.0	4.0	5.0	6.0	8.5
2.0	4.0	5.0	6.5	9.0
2.0	4.5	5.0	6.5	9.0
2.5	4.5	5.0	6.5	9.0
2.5	4.5	5.5	7.0	11.0

a) Calculate the sample mean $\bar{x}$ and the sample standard deviation s for the length of time customers at a clothing store claimed to wait in the checkout line until their turn. (Round your answers to two decimal places.)

Construct a histogram.



b) Describe the shape of your histogram and select the graph that fits



c) Using the mean and standard deviation from part a, find the theoretical probability of a customer waiting over 8.2 minutes assuming wait time is normally distributed. Compare that to the relative frequency of the number of customers in our sample that waited over 8.2 minutes.

#5.) The patient recovery time from a particular surgical procedure is normally distributed with a mean of 6.5 days and a standard deviation of 1.3 days.

What is the z-score for a patient who takes 9 days to recover? (Round your answer to two decimal places.)

#6.) $X \sim U(0, 30)$. Suppose that you form random samples of 35 from this distribution. Let $\bar{X}$ be the random variable of averages.

a) Give the distribution of $\bar{X}$ with its proper parameters.

b) Find the probability. (Round your answer to four decimal places.)

$$P(12 < \bar{X} < 16) =$$

#7.) Suppose that the distance of fly balls hit to the outfield (in baseball) is normally distributed with a mean of 242 feet and a standard deviation of 50 feet. We randomly sample 64 fly balls.

- If X = distance in feet for a fly ball, then give the distribution of X .
- If $\bar{X}$ = average distance in feet for 64 fly balls, then give the distribution of $\bar{X}$. Round your standard deviation to two decimal places.
- What is the probability that the 64 balls traveled an average of less than 234 feet?
- Find the 65th percentile of the distribution of the average of 64 fly balls. (Round your answer to two decimal places.)