College Prep Stats
Chapter 6 Review

Name: _____

**For number 1**, assume that heights of men are normally distributed with a mean of 69.0 inches and a standard deviation of 2.8 inches. Also assume that heights of women are normally distributed with a mean of 63.6 inches and a standard deviation of 2.5 inches (based on data from the National Health Survey).

1. The standard casket has an inside length of 78 inches.
a) What percentage of women are too tall to fit in a standard casket?

b) What percentage of men fit in a standard casket?

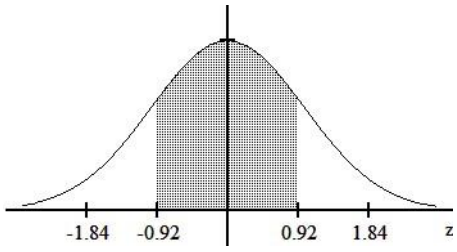
c) A manufacturer of caskets wants to reduce production costs by making smaller caskets. What inside length would fit all men except the tallest 1%?

2. In order to have a precision dance team with a uniform appearance, height restrictions are placed on the famous Rockette dancers at New York's Radio City Music Hall. Because women have grown taller over the years, a more recent change now requires that a Rockette dancer must have a height between 66.5 inches and 71.5 inches. What percentage of women meet this height requirement?

3. Assume the following sample statistics were obtained from a simple random sample. Which of the following statements are true?

a) The sample mean $\bar{x}$ targets the population mean $\mu$ in the sense that the mean of all sample means is $\mu$.
b) The sample proportion $\hat{p}$ targets the population proportion $p$ in the sense that the mean of all sample proportions is $p$.
c) The sample variance $s^2$ targets the population variance $\sigma^2$ in the sense that the mean of all sample variances is $\sigma^2$.
d) The sample median targets the population median in the sense that the mean of all sample medians is equal to the population median.
e) The sample range targets the population range in the sense that the mean of all sample ranges is equal to the range of the population.

4. Find the area of the shaded region in the following figure.




5.
a) Find the standard $z$ score with a cumulative area to its left of 0.6700
b) Find the standard $z$ score with a cumulative area to its right of 0.9960
c) Find the value of $z_{0.025}$.

6. Under older Federal Aviation Administration rules, airlines had to estimate the weight of a passenger as 185 lb. (That amount is for an adult traveling in winter, and it includes 20 lb of carry-on baggage.) Current rules require an estimate of 195 lb. Men have weights normally distributed with a mean of 172 lb and a standard deviation of 29 lb.

a) If 1 adult male is randomly selected and is assumed to have 20 lb of carry-on baggage, find the probability that his total is greater than 195 lb.
b) If a Boeing 767-300 aircraft is full of 213 adult male passengers and each is assumed to have 20 lb of carry-on baggage, find the probability that the mean passenger weight (including carry-on baggage) is greater than 195 lb.

7. If selecting samples of size $n > 30$ from a population with a known mean and standard deviation, what requirement, if any, must be satisfied in order to assume that the distribution of the sample means is a normal distribution?
a) The population must have a standard deviation of 0.
b) None; the distribution of sample means will be approximately normal.
c) The population must have a normal distribution
d) The mean must equal the standard deviation.

8. The amount of snowfall falling in a certain mountain range is normally distributed with a mean of 94 inches and a standard deviation of 14 inches. What is the probability that the mean annual snowfall during 49 randomly picked years will exceed 96.8 inches?

9. If the mean of the population is $\mu = 63.6$ in, what is the mean of the sampling distribution?

For number 10, assume temperature readings at the freezing point of water are normally distributed with a mean of 0°C and a standard deviation of 1°C.

a) Find the temperature separating the bottom 95% from the top 5%.
b) Find the temperatures separating the bottom 2.5% and the top 2.5%.

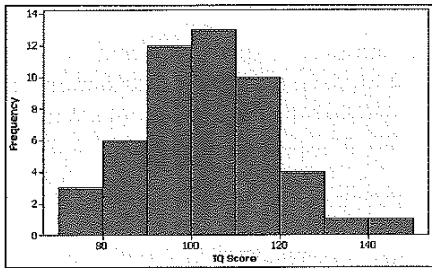
10. Use the continuity correction and describe the region of the normal distribution that corresponds to the probability of 25 or more.

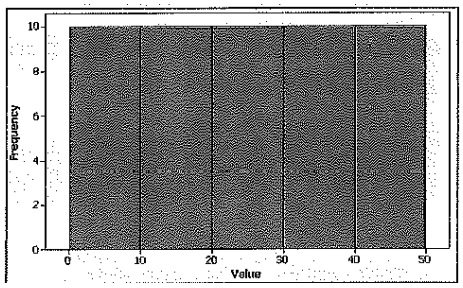
11. If 10% of men are bald, what is the probability of selecting less than 100 bald men in a sample of 818 men.

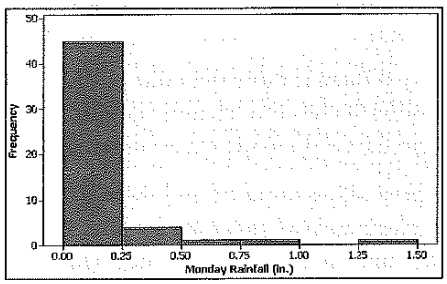
12. Suppose that a sample of 20 tires of the same type is obtained at random. It is understood that 8% of all the tires are defective. What is the probability that 15 or fewer of the collected tires are defective?

13. The Driscoll Power Company provides electricity with voltage levels that are uniformly distributed between 123 and 125 volts. Find the probability that a randomly selected voltage level is greater than 124.5 volts.

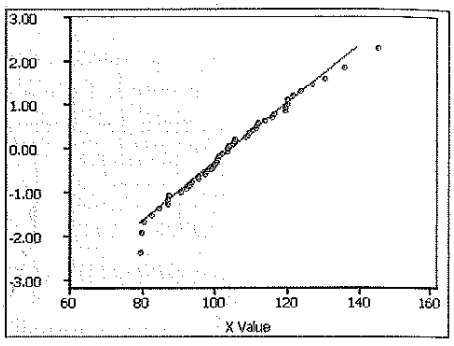
14. Determine if normality can be rejected.

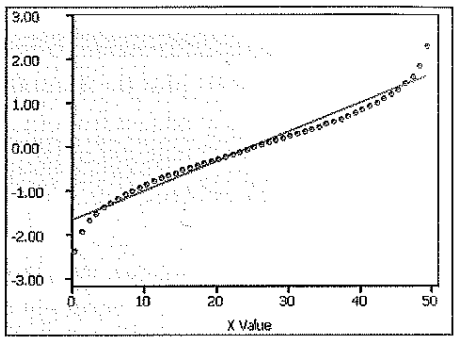


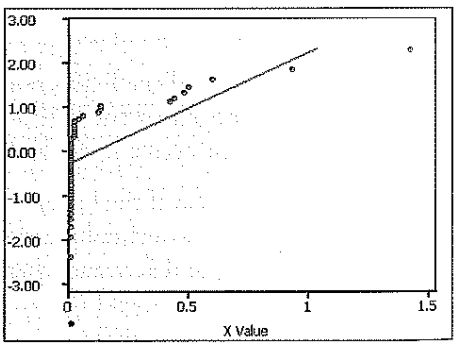




15. Determine if normality can be rejected.




******Don't forget to also review how to create a normal quantile plot on your graphing calculator! ******

**For numbers 1 – 4**, assume that heights of men are normally distributed with a mean of 69.0 inches and a standard deviation of 2.8 inches. Also assume that heights of women are normally distributed with a mean of 63.6 inches and a standard deviation of 2.5 inches (based on data from the National Health Survey).

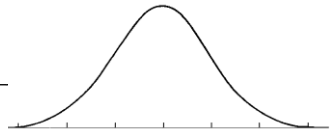
1. A day bed is 75 inches long.

a) Find the percentage of men with heights that exceed the length of a day bed.

_____= _____ = _____

b) Find the percentage of women with heights that exceed the length of a day bed. Round your answer to six decimal places.

_____= _____ = _____



2. In designing a new bed, you want the length of the bed to equal or exceed the height of 95% of all men. What is the minimum length of this bed?

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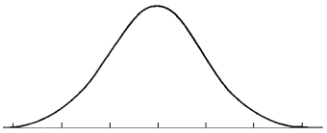

3. The standard casket has an inside length of 78 inches.

a) What percentage of men are too tall to fit in a standard casket?

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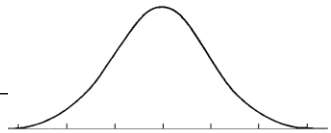

b) What percentage of women are too tall to fit in a standard casket?

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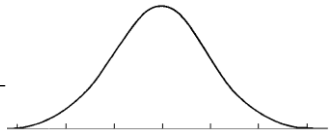

c) A manufacturer of caskets wants to reduce production costs by making smaller caskets. What inside length would fit all men except the tallest 1%?

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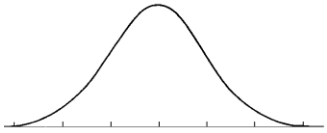

4. In order to have a precision dance team with a uniform appearance, height restrictions are placed on the famous Rockette dancers at New York's Radio City Music Hall. Because women have grown taller over the years, a more recent change now requires that a Rockette dancer must have a height between 66.5 inches and 71.5 inches. What percentage of women meet this height requirement?

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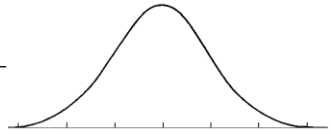
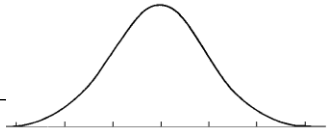
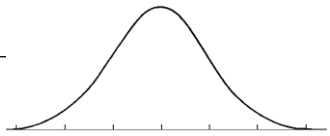


6. The serum cholesterol levels in men aged 18 – 24 are normally distributed with a mean of 178.1 and a standard deviation of 40.7. Units are in mg/100 mL, and the data are based on the National Health Survey.

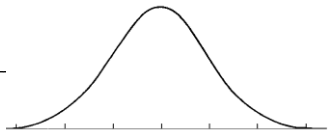
a) If 1 man aged 18 – 24 is randomly selected, find the probability that his serum cholesterol level is greater than 260, a value considered to be "moderately high."

_____= _____ = _____ 

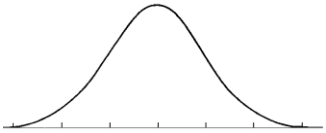
b) If 1 man aged 18 – 24 is randomly selected, find the probability that his serum cholesterol level is between 170 and 200.

_____= _____ = _____ 

c) If 9 men aged 18 – 24 are randomly selected, find the probability that their mean serum cholesterol level is between 170 and 200.

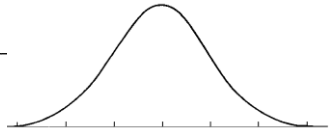
_____= _____ = _____ 

d) The Providence Health Maintenance Organization wants to establish a criterion for recommending dietary changes if cholesterol levels are in the top 3%. What is the cutoff for men aged 18 – 24?

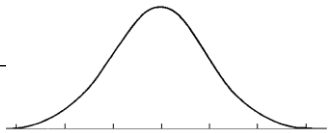
_____ = _____ 

12. Under older Federal Aviation Administration rules, airlines had to estimate the weight of a passenger as 185 lb. (That amount is for an adult traveling in winter, and it includes 20 lb of carry-on baggage.) Current rules require an estimate of 195 lb. Men have weights normally distributed with a mean of 172 lb and a standard deviation of 29 lb.

a) If 1 adult male is randomly selected and is assumed to have 20 lb of carry-on baggage, find the probability that his total is greater than 195 lb.

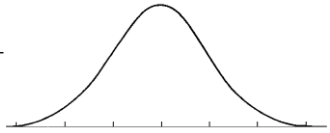
_____= _____ = _____ 

b) If a Boeing 767-300 aircraft is full of 213 adult male passengers and each is assumed to have 20 lb of carry-on baggage, find the probability that the mean passenger weight (including carry-on baggage) is greater than 195 lb.

_____= _____ = _____ 

25. The amount of snowfall falling in a certain mountain range is normally distributed with a mean of 94 inches and a standard deviation of 14 inches. What is the probability that the mean annual snowfall during 49 randomly picked years will exceed 96.8 inches?

_____= _____ = _____



26. The annual precipitation amounts in a certain mountain range are normally distributed with a mean of 107 inches, and a standard deviation of 12 inches. What is the probability that the mean annual precipitation during 36 randomly picked years will be less than 109.8 inches?

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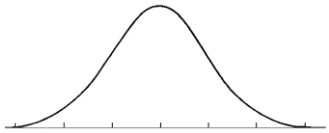

32. The Oswego Power and Light Company provides electricity with voltage levels that are uniformly distributed between 104 volts and 118 volts. Round answers to four decimal places.

a) Create the graph of the uniform distribution. Label the axes with your data.

b) If one voltage level is randomly selected, what is the probability that it is less than 108.5?

c) If one voltage level is randomly selected, what is the probability that it is more than 109.1?

d) If one voltage level is randomly selected, what is the probability that it is between 111.2 and 116.5?