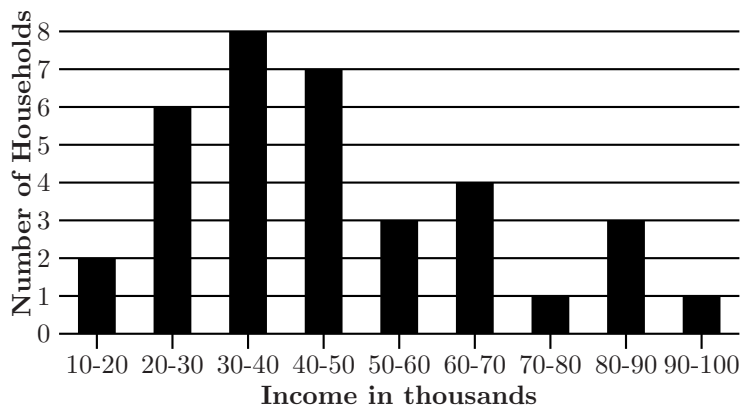


Review for Exam 4  
Math 102

Complete the following exercises for a review. Questions on the exam will be similar to questions on this review, questions from the homework assignments and the suggested exercises.

- Consider the following data set 10, 21, 12, 16, 9, 18, 17, 16, 10, 20, 19, 19, 15, 16, 12, 17, 14, 15, 17, 12, 20. Answer the following questions about this set.
  - Create a frequency table for the data.
  - Draw a bar graph describing the distribution.
  - Find the mean, median and mode.
  - Find the 5 number summary and give a box and whisker plot of the data.
  - Find the standard deviation.
  - Find the coefficient of variation for this data.
- The data set describes exam scores for students in a class. Draw a stem and leaf diagram with the tens place as the stem and the ones place as the leaf.  
84,73,56,61,65,78,82,91,73,59,63,72,80,89,71,63,90,54,32,67,75,85
- A machine manufactures mints. The following is a list of weights of mints in grams that are supposed to weigh 20.4 grams. Give a frequency table of the data with classes of width 0.2 starting at 20.65 and ending at 22.05. Draw a histogram representing the data. Is the machine doing a good job?  
21.8 21.7 21.7 21.6 21.3 21.6 21.5 21.3 21.2  
21.0 21.6 21.6 21.6 21.5 21.4 21.8 21.7 21.6  
20.7 21.1 20.8 21.2 21.1 22.0 22.0 21.7 21.6  
21.6 21.3 21.9 21.6 21.0 20.7 21.8 21.7 20.8
- 35 people took a survey in Moorhead asking about yearly household income. The results are described in the following histogram. Use the histogram to answer the following questions.



- How many households have income at least \$50,000 per year?
- What percentage of households earn at least \$90,000 per year?
- What household income level responded most frequently to the survey?
- What percentage of people are earning at most \$30,000 per year?
- What class would you expect the median income to fall in?
- According to the survey more people make between 60,000 and 70,000 per year than make between 50,000 and 60,000 per year. Do you think that this survey accurately reflects the income levels in Moorhead?

(g) What questions would you want answered to further understand the results of the survey?

5. Use the following frequency table to compute the mean, median, mode, standard deviation, and coefficient of variation for the data.

$x$	$f$
14	3
15	0
16	2
17	5
18	4
19	2
20	3

6. Find the percentage of area under the standard normal curve of the region specified.

- (a) Between  $z = 0$  and  $z = 1.11$                       (d) To the left of  $z = 0.83$   
(b) Between  $z = 1.3$  and  $z = 3.1$                       (e) Between  $z = -1.12$  and  $z = 0$   
(c) To the right of  $z = 2.12$                               (f) Between  $z = -0.85$  and  $z = 1.5$

7. Find a  $z$ -score such that 12% of the area under the standard normal curve is to the right of this score.

8. Find a  $z$ -score such that 25% of the area under the standard normal curve is to the left of this score.

9. Find the  $z$ -score corresponding to the following raw scores give the mean and the standard deviation.

- (a)  $x = 4.5, \mu = 3, \sigma = 1$                               (c)  $x = 32, \mu = 28, \sigma = 1.6$   
(b)  $x = 2, \mu = 5, \sigma = 1.5$                               (d)  $x = 14.3, \mu = 16, \sigma = 0.8$

10. Find the raw score corresponding to the following raw scores given the mean and the standard deviation.

- (a)  $z = 2.1, \mu = 5, \sigma = 1$                               (c)  $z = -1.5, \mu = 10, \sigma = 2$   
(b)  $z = 1.37, \mu = 22, \sigma = 3$                               (d)  $z = -0.8, \mu = 100, \sigma = 12$

11. In 2007 the mean height for an adult male was 68.8 inches with a standard deviation of 2.8 inches. Assume that human height follows a normal distribution to answer the following questions.

- (a) What percentage of adult males do you expect to be between 66 inches and 70.6 inches tall?  
(b) What percentage of adult males do you expect to be taller than 6 feet?  
(c) What percentage of adult males do you expect to be shorter than 66 inches?

12. 500 people take a standardized test. Assume the scores follow a normal distribution with mean 70 and standard deviation 12.

- (a) How many people do you expect to score below 70?  
(b) How many people do you expect to score between 80 and 90?  
(c) How many people do you expect to score below 60?  
(d) How many people do you expect to score above 95?

13. A notebook computer manufacturer has found that its computers have a mean operating life of 4380 hours with a standard deviation of 1424 hours. We assume that the customer will use the computer about 4 hours per day. The manufacturer wants to write a warranty so that no more than 2% of the notebook computers are returned for warranty repair. How long should the warranty be in days? In years?