

22S:008 Exam 1, Sept. 25, 1998 Name: _____

Please circle one. Section: 10:30 or 11:30

Please enter all of your answers on these exam pages. There are 17 questions. Notice the Defective Question Report page at the end of the exam.

1. (4 pts.) The average score on an exam was 38. About 68% of the scores were between 36 and 40. If you scored 42, which of the following is the most reasonable approximation to your *standardized score*? You may assume that the distribution of scores is symmetric and mound-shaped. Show your work, for example, draw an appropriate graph, then circle the one best answer.
 - A) 1
 - B) 2
 - C) 3
 - D) 4
 - E) 5

2. (4 pts.) Sales this month decreased 15% from last month to 251 million dollars. What were sales last month to the nearest million) Show your work then circle the one best answer.
 - A) 38 million
 - B) 213 million
 - C) 289 million
 - D) 295 million
 - E) 1673 million

3. The two-way table below displays counts for people classified by Gender and Martital Status:

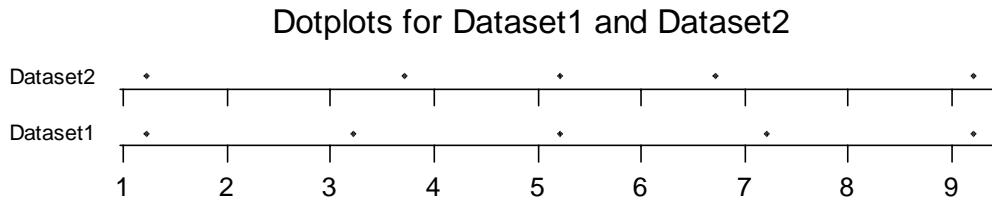
	Single	Married	Other
Female	100	40	60
Male	200	60	40

- a) (3 pts.) What percentage of married people are male?

- b) (3 pts.) What percentage of the people are single?

- c) (3 pts.) What percentage of the people are single females?

4. Two dotplots are shown below.



a) (3 pts.) Which of the two has the larger standard deviation? Explain your answer.

b) (2 pts.) Which of the two has the larger range? Explain your answer.

5. (4 pts.) A group is composed of 10 men and 20 women. The average (mean) weight of the men is 170 pounds and the average weight of the women is 120 pounds. What is the average (mean) weight of all 30 people?

6. (3 pts.) A large company has 800 female employees and 150 male employees. The CEO wants to compare the distribution of salaries of the females to the males. What graphical display would be best for this comparison? Explain your choice.

7. Which of the following data sets is longitudinal and which is cross-sectional?

- a) (1 pt.) The weights of patients getting their physicals at the University Hospital on September 12, 1998. Cross-sectional or longitudinal?
- b) (1 pt.) Average weekly salaries for McDonalds workers from June 1995 to January 1998. Cross-sectional or longitudinal?
- c) (1 pt.) The ages of the spectators at the Iowa-Iowa State game this fall. Cross-sectional or longitudinal?

8. (4 pts.) A set of 29 accounts has a mean of \$100 and a standard deviation of \$10. These are US dollars. One Canadian dollar is worth only 0.80 US dollars. What would the mean and standard deviation of the 29 accounts be in Canadian dollars? Show your work.

9. (1 pt.) Consider the following stem-and-leaf plot.

```

Stem-and-leaf      N = 25
Leaf Unit = 1.0
  0 3
  0 59
  1 1
  1 5
  2 2
  2 557789
  3 011223334
  3 5689

```

Based on the above plot, which one of the following statements is true? Circle the true statement.

- I. The data is skewed toward higher values.
- II. The data is skewed toward lower values.
- III. The data is distributed symmetrically.

10. (5 pts.) What is the standard deviation for the five data values given in the table?

Show your work.

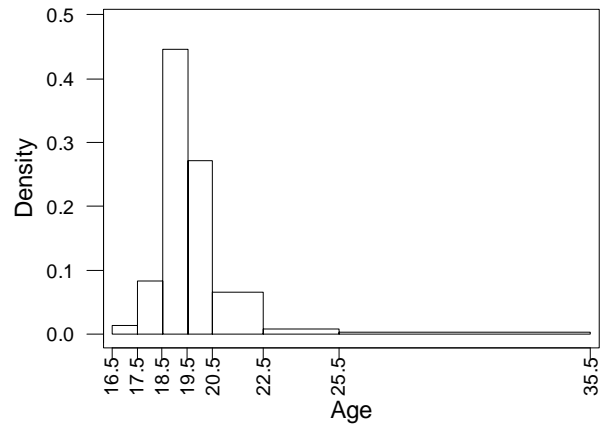
Data		
5		
9		
4		
7		
5		

11. If you are interested in:

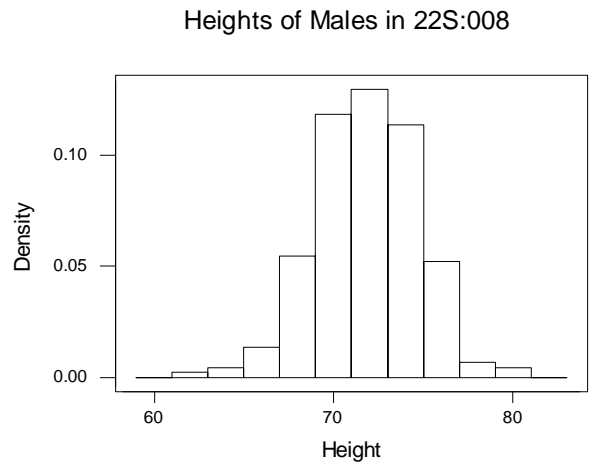
- a) (3 pts.) predicting future behavior of a *random process*, would it be more helpful to look at a dotplot of the data or a sequence plot? Explain.

- b) (3 pts.) If you are interested in predicting future behavior of a *meandering process*, would it be more helpful to look at a histogram of the data or a sequence plot? Explain.

12. (5 pts.) The density histogram at the right is of the ages of the students in a large class (defined as age last birthday in years). There are 345 ages in the dataset. From this plot, about how many 20-year olds were in the class? Explain your reasoning.



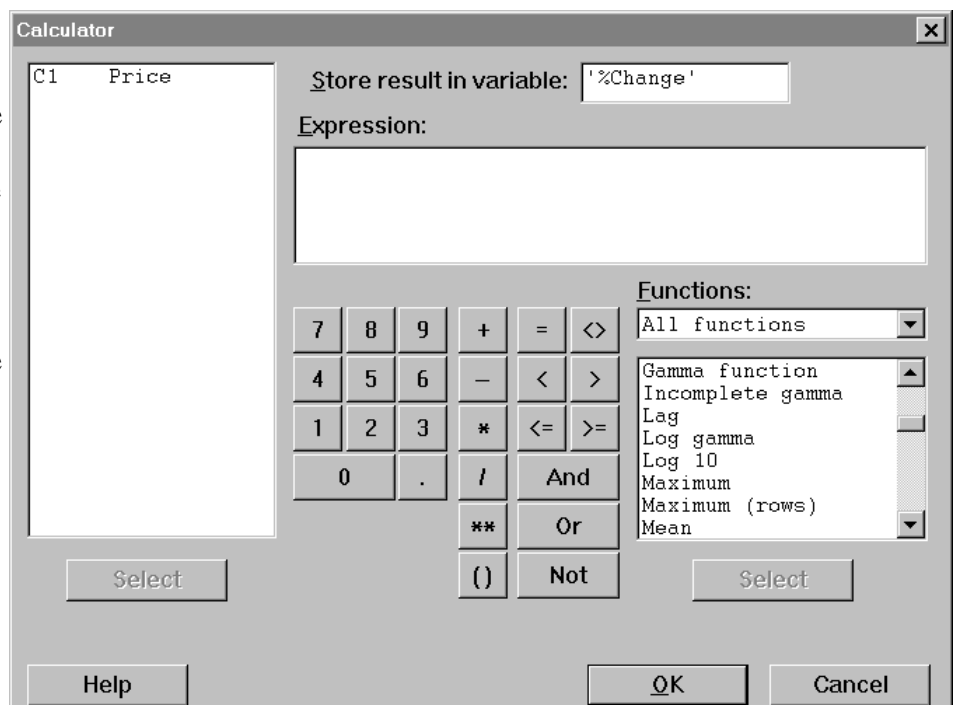
13. (3 pts.) The density histogram at the right displays the distribution of heights of the 220 males in a class. The mean is 71.3 inches and the standard deviation is 2.7 inches. About what percentage of the heights fall below 74 inches? (Notice that the distribution is quite mound-shaped.)



14. The Minitab Calculator dialog box is shown at the right.

a) (3 pts.) Show how to fill in the Expression box to calculate the percentage changes of the Price series. Write your answer in the box.

b) (1 pt.) What is the name of the column where the percentage changes will be placed?



15. A recent statistics book reported the following study:

Does Use of Marijuana During Pregnancy Affect Birth Weight?

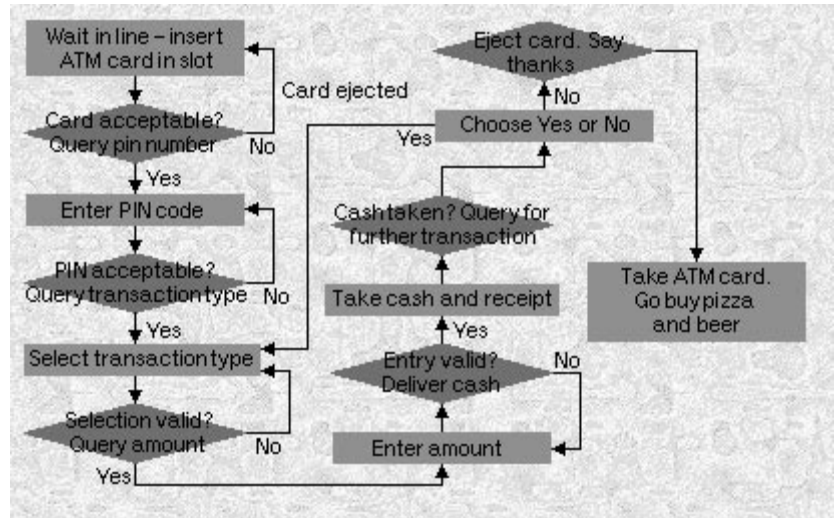
During 1985, approximately 31% of American women in their late teens and early 20s reported that they had used marijuana within the previous year. These are the prime reproductive years for women, and researchers were concerned about the possible effects of marijuana use during pregnancy on fetal growth and development. In the *New England Journal of Medicine*, Zuckerman et al. presented the results of a large-scale study of mothers, recruited over a three-year period from a general prenatal clinic. Among other findings, the researchers reported that the mean birth weight of infants born to 895 mothers who *did not* use marijuana during pregnancy was 3260g, with a standard deviation of 616g. The mean birth weight of infants born to 202 mothers who *did* use marijuana during pregnancy was 2980g, with a standard deviation of 662g.

- a) (3 pts.) Do you think this study is an *experiment*, a *probability survey*, or an *observational study*? (Explain your thinking.)
- b) (4 pts.) Assuming the birth weight distributions are roughly mound-shaped, sketch the density histograms of the two distributions. Be sure to label the data axis carefully. You need not put a scale on the vertical axis. (You may draw smooth curves rather than steps.)

16. Consider the diagram shown at the right.

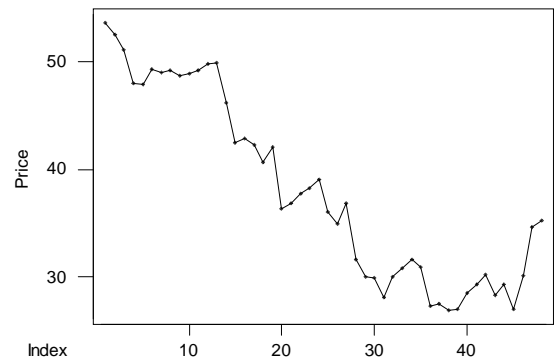
a) (2 pts.) What do we call such a diagram?

b) (2 pts.) What do we use these diagrams for?

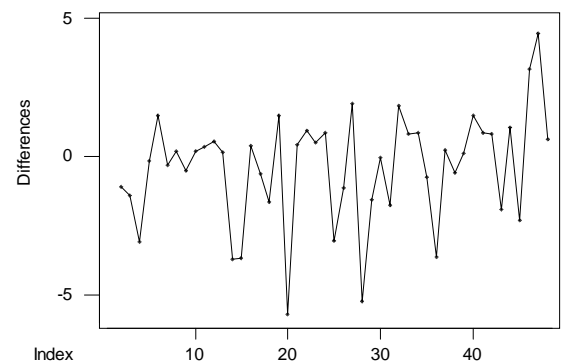


17. The graph at the right shows the daily closing price of a certain stock.

a) (2 pts.) Describe this sequence of prices using terms like random, meandering, or seasonal.



b) (2 pts.) The graph at the right shows the differences or price changes for the daily closing prices shown above. Describe this sequence of prices using terms like random, meandering, or seasonal.



Defective Question Report

Name: _____

Section: _____

If you believe that a test question is defective in some way, please list your complaint here. All complaints will be considered in our interpretation of the test results.

Question number: _____

Your complaint:

Question number: _____

Your complaint:

Question number: _____

Your complaint: