Statistics ~ Business Statistics
SAMPLE TEST 1
(Revised Spring 2019)

Answer these questions.

1.   Statistics was first developed in the border between what two centuries?

2.   What was one of the problems that originally led to the development of statistics?

3.   Name any of the problems that statistics was applied to later (in the 19th or 20th Centuries).

4.   What does the word **significant** mean in statistics?

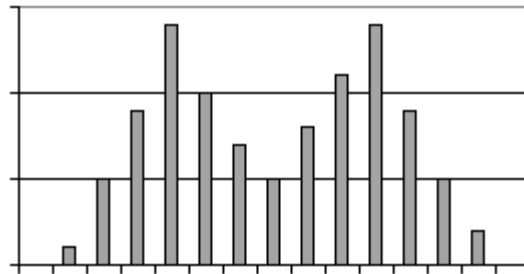MATCHING: Write the letter of the best answer on the line.

A.	bimodal distribution	C.	uniform distribution
B.	normal distribution	D.	skewed distribution

_____5. ↓
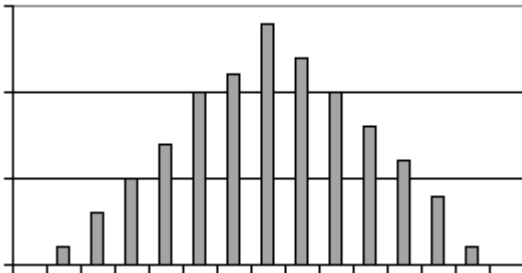
_____6. ↓

_____7. ↓
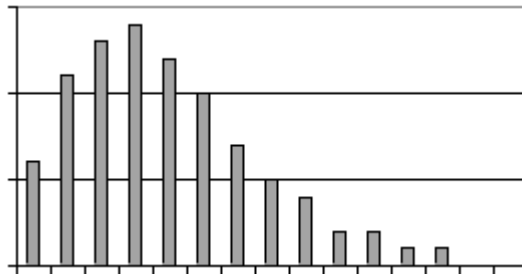
_____8. ↓
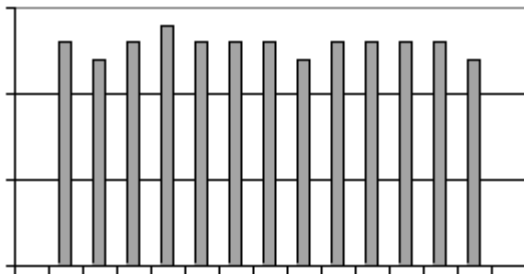
MATCHING: Write the letter of the best answer on the line.

A.	descriptive statistics	D.	ogive	H.	population
B.	gap	E.	outlier	I.	relative frequency
C.	inferential statistics	F.	parameter	J.	sample
		G.	placebo	K.	statistic

_____9.   a piece of data that is much larger or smaller than the rest of the data

_____10.   a small group that represents the population

_____11.   the branch of statistics where you organize and describe data

_____12.   a piece of information about the population

_____13.   a piece of information about the sample

_____14.   the branch of statistics where you interpret and make decisions

_____15.   a line graph that shows the cumulative frequency over time and never decreases

_____16.   a large group about which you want to find out information

_____17.   the percent (or fraction of a sample) that falls within a given category or range

_____18.   a fake treatment, intended to make people think some treatment is happening

MATCHING: Write the letter of the best answer on the line.

A.	coefficient of variation	E.	midrange	I.	range
B.	frequency	F.	mode	J.	standard deviation
C.	mean	G.	qualitative data	K.	trimmed mean
D.	median	H.	quantitative data	L.	variance

_____19.   the square of the standard deviation

_____20.   the number of data that falls within a given category or range

_____21.   interval and ratio data: numbers that measure things

_____22. $\bar{x}$ or μ …   the arithmetical average of the data

_____23.   removing a percentage of the top and bottom scores and averaging the remaining data

_____24.   measure of dispersion that expresses the spread of the data as a percent of the mean

_____25. σ or s or Sx …   the average distance the data are from the mean

_____26.   Med or $\tilde{x}$ …   the exact center of the data—same number of scores higher and lower

_____27.   the most common score in a set of data

_____28.   nominal and interval data: characteristics of things

_____29.   the distance between the top and bottom numbers in a set of data

_____30.   halfway between the top and bottom numbers in a set of data

Which method of gathering data is used in each example below?

A. census   B. experiment   C. sampling   D. simulation

_____31.   finding the average age of students at Iowa Lakes by asking the registrar for a list of the ages of all ILCC students

_____32.   investigating the effect of environmental damage caused by a factory by creating a computer model of the factory and its surrounding area.

_____33.   seeing if a new AIDS drug works by giving traditional AIDS treatment to 40 patients and the new drug to 40 other patients, and then comparing how each group did

_____34.   finding out how often the word "love" is used in the Bible by searching through the entire Bible to find occurrences of the word "love"

_____35.   finding out the average caffeine in a coffee by doing chemical tests on 8 different cups of coffee

_____36.   using one type of fertilizer in one field and a second type of fertilizer in another field to see which works better

Which type of data is used in each example below?

A. nominal   B. ordinal   C. interval   D. ratio

_____37.   the number of potato chips a person eats in a day

_____38.   the reading level of a book: easy, intermediate, or advanced

_____39.   the date on which an event happens

_____40.   favorite sport: baseball, football, basketball, hockey, track, golf, tennis, or auto racing

_____41.   rating of a movie: G, PG, PG-13, R, NC-17

_____42.   the entrée selected by a guest at a wedding banquet: beef, chicken, fish, or vegetarian

Which type of sample is used in each example below?

A. convenience   C. random   E. systematic
B. cluster   D. stratified

_____43.   calling every seventeenth name in the telephone book

_____44.   deciding who is in a treatment group and who is in a control group by flipping a coin for each person: heads=treatment, tails=control

_____45.   choosing a sample that includes children, young adults, middle-aged people, and senior citizens in the same proportion as the United States as a whole

_____46.   test marketing a new product in Peoria, Cedar Rapids, and Columbus, because you think these three cities are "typical" places that represent the country as a whole

_____47.   asking six people who work at the same place you do

_____48.   choosing a stock portfolio by dividing all companies into conservative, moderate risk, and high risk, and then selecting stocks from each group

MATCHING: Write the letter of the best answer on the line.

A.   bar graph   B.   circle graph   C.   line graph

_____49.   type of graph that is best suited to showing percentages of things in various categories

_____50.   type of graph that is best suited to showing the number of things in various categories

_____51.   type of graph that is best suited to showing changes in something over time

52.   Make a **stem-and-leaf plot** to represent the data below:

Iowa's Largest Cities (cities over 15,000 listed … population in thousands—2010 Census):

City	Population
Ames	59
Ankeny	27
Bettendorf	33
Burlington	27
Cedar Falls	39
Cedar Rapids	126
Clinton	27
Clive	17
Coralville	19
Council Bluffs	62
Davenport	101
Des Moines	202
Dubuque	58
Fort Dodge	25
Indianola	15
Iowa City	68
Marion	35
Marshalltown	26
Mason City	29
Muscatine	22
Newton	15
Ottumwa	25
Sioux City	82
Urbandale	40
Waterloo	69
West Des Moines	57

53.   What kind of distribution is this: bimodal, normal, uniform, or skewed? Why?

54.   Where is there a **_cluster_**?

55.   Describe any **_gaps_** or **_outliers_** in the distribution.

Use the data about Iowa cities on the previous page to answer these questions.

_____56.   What is the **mean**?

_____57.   What is the **mode**?

_____58.   What is the **median**?

_____59.   What is the **midrange**?

_____60.   What is the **range**?

_____61.   What is the **standard deviation**?

_____62.   What is the **coefficient of variation**?

Here are the number of pages in 7 books: 62, 115, 198, 247, 252, 300, 480

_____63.   What is the **mean** of the data above?

_____64.   What is the **median** of the data above?

_____65.   What is the **range** of the data above?

_____66.   What is the **standard deviation**?

_____67.   What is the **variance**?

_____68.   What is the **coefficient of variation**?

   69.   Why is there **no mode** for this data?

Consider these numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 400.
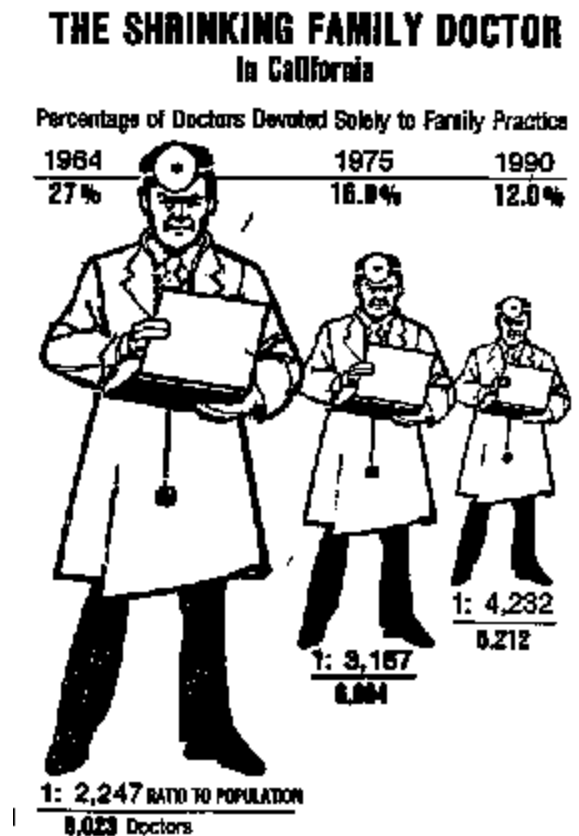
_____70.   Find a 10% trimmed mean for this data.

_____71.   Which type of average—**mean**, **median**, or **mode**—is most affected by outliers?

_____72.   Which type of average—**mean**, **median**, or **mode**—can have more than one value for the same set of data?

_____73.   Which type of average—**mean**, **median**, or **mode**—is normally **NOT** one of the values in the sample?
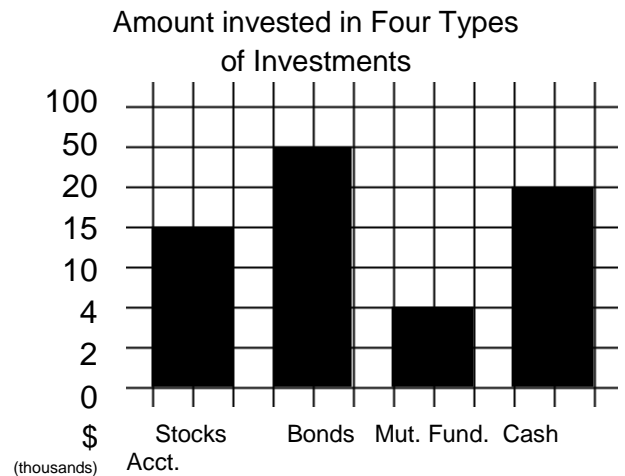
Answer these multiple choice questions.

_____74.   Which type of sample is considered the best for statistical purposes?
                A.   convenience sample   D.   systematic sample
                B.   cluster sample   E.   random sample
                C.   stratified sample

_____75.   Which type of distribution is considered the best for statistical purposes?
                A.   bimodal distribution   C.   uniform distribution
                B.   normal distribution   D.   skewed distribution

Answer the following:

76.   There are several things that are misleading about this graph. Name the most important thing wrong with it.

THE SHRINKING FAMILY DOCTOR
In California

Percentage of Doctors Devoted Solely to Family Practice

1964	1975	1990
27%	16.0%	12.0%

1: 4,232
5.212

1: 3,167
6.004

1: 2,247 RATIO TO POPULATION
9,023 Doctors

77.   What is the main thing that makes this bar graph misleading?

Amount invested in Four Types of Investments

100
50
20
15
10
4
2
0
$ Stocks   Bonds   Mut. Fund. Cash
(thousands)   Acct.

78. What is the main thing that makes this bar graph misleading?

CNN.com
CNN/USA TODAY/GALLUP POLL

Results by party   ← PREVIOUS   NEXT →

☐ Agree

```
63
62        62
61
60
59
58
57
56
55
54                  54          54
53
     Democrats  Republicans  Independents
         RESULTS BY PARTY
```

Question 2: Based on what you have heard or read about the case, do you agree with the court's decision to have the feeding tube removed?

SAMPLE: Interviews conducted by telephone March 18-20, 2005, with 909 adults in the United States.   **SAMPLING ERROR:** +/- 7% pts

79. Why is the main thing that makes this circle graph misleading?

Maize Production

Other
Brazil
Romania
China
United States
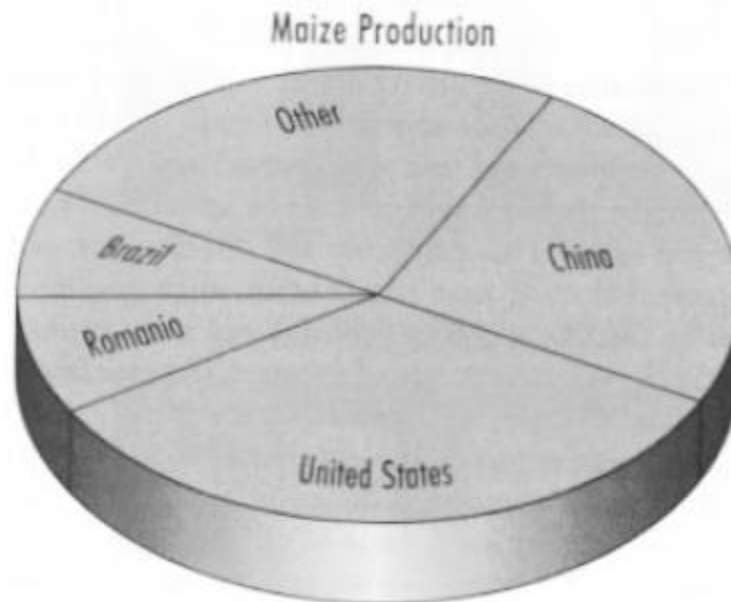
80. Why would the information at right **not** work well in a **circle graph**?

Percentage of Students Enrolled in Classes

Course		Percentage
Math Courses	→	22%
Science Courses	→	18%
English Courses	→	37%
Social Studies Courses	→	40%
Business Courses	→	29%
Other Courses	→	35%

Record High Temperatures in Selected States (degrees Farenheit)

(There are 20 states on the list)

California	134	Iowa	118	Virginia	110
Arizona	128	Tennessee	117	Florida	109
Nevada	125	Mississippi	115	New York	108
New Mexico	122	Louisiana	114	Rhode Island	104
Kansas	121	Wisconsin	114	Hawaii	100
South Dakota	120	Wyoming	114	Alaska	100
Oklahoma	120	Ohio	113		

_____81.   What is the percentile rank of the Arizona on this list?

_____82.   What is the percentile rank of the Louisiana?

_____83.   What is the percentile rank of Alaska?

_____84.   What is the percentile rank of California?

_____85.   Which state ranks at the 55th percentile?

_____86.   Which state ranks at the 30th percentile?

Order of finish for 12 girls running a race:

| 1st = Amanda	5th = Emily	9th = Inez
2nd = Brenda	6th = Franchesca	10th = Justine
3rd = Charisse	7th = Gigi	11th = Katrina
4th = Darlene	8th = Henrietta	12th = Loni

_____87.   To the nearest whole number, what is Darlene's percentile rank?

_____88.   Which girl ranks closest to the 40th percentile?

_____89.   Which girl ranks closest to the 10th percentile?

_____90.   There are eight students in this class. Suppose you got a perfect score on this test. What is the highest your percentile could be?

Using the box and whisker plots below to answer the questions.

Group 1

Group 2

Group 3

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
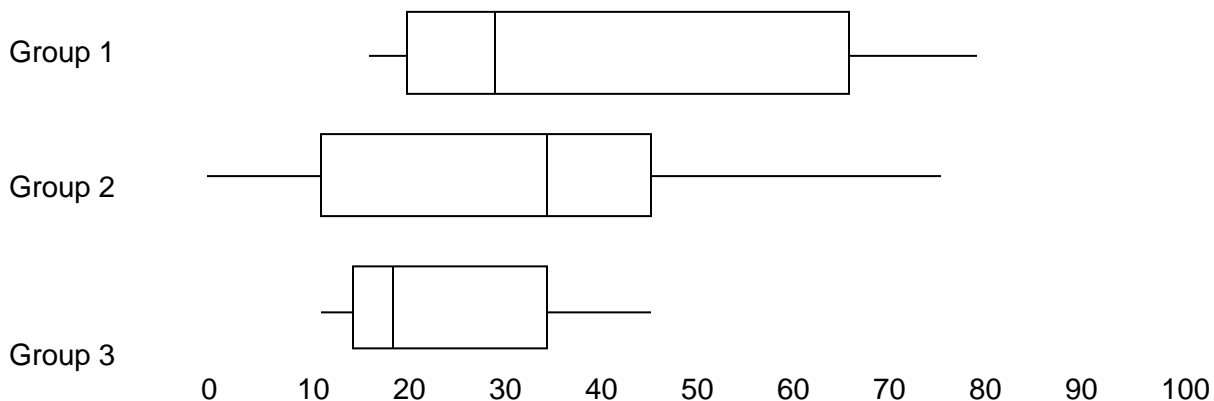
_____91.   Which group has the lowest median?

_____92.   Which group has the highest overall score?

_____93.   Which group has the highest median?

_____94.   Which group is the most spread out?

_____95.   Which group has smallest interquartile range?

Use this box and whisker plot for the questions on the next page:

Box-and-Whisker plot ▬ ▢ ✕

| 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 |
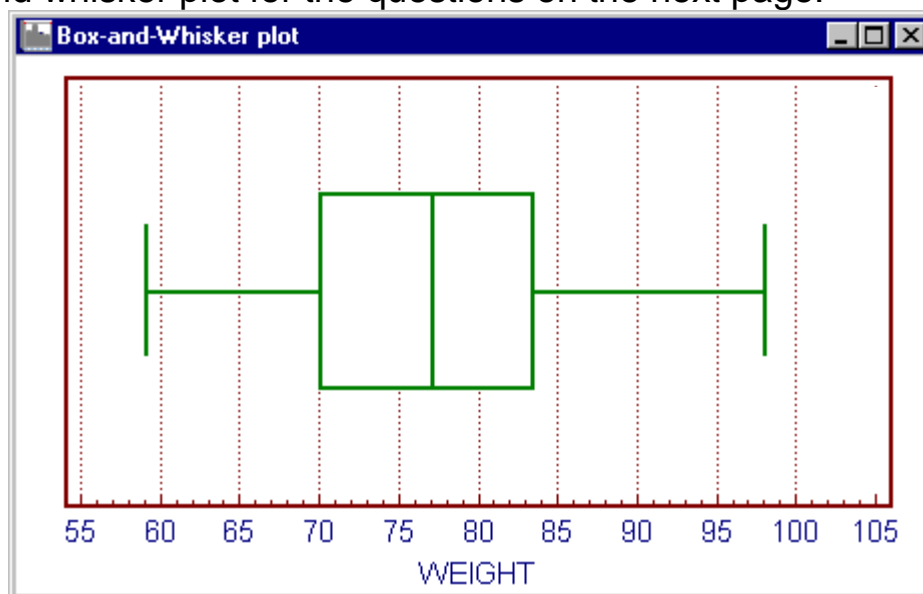
WEIGHT

_____96.   Approximately what is the highest weight in this data?

_____97.   Approximately what is the range?

_____98.   Approximately what is the median?

_____99.   Approximately what is the interquartile range ($Q_3 - Q_1$)

100.   Given these numbers: 18, 19, 19, 36, 52, 75, 84, 93, 100 , find the **five number summary**:

101.   Find the **interquartile range** of the numbers in Problem 20.