Test 2 Review – Math 105   Name: _____
Thonney

Show your work as much as possible for partial credit. You may use a calculator. 100 points total.

1. Here is a list of questions I asked my students in a class survey. What type of data will the question generate? Write either C for categorical or Q for Quantitative.

    ___ How many hours do you normally work per week?
    ___ What city or town do you live in?
    ___ What is your height in inches?
    ___ What is your major?

2. I asked statistics students the question "What is your relationship status" for several terms. Here is a summary of their responses.

| Relationship Status	Frequency	Relative Frequency	Degrees in a Pie Chart
Engaged	2	2/164=0.0122 nearest hundredth 0.01	**(2/164)*360**=0.0122*360= 4.39 degrees 0.01*360=3.6 degrees rounds to 4 degrees
In a Relationship	73		
It's complicated	15		
Married	16		
Single	58		

a. In the table above, fill in the relative frequency as a decimal rounded to the nearest hundredth (2 decimal places).

b. In the final column fill in the degrees that category should have in a pie chart. Round to the nearest whole degree.

c. Draw a pie chart to represent this data. Label each section with its relationship status and a percentage.
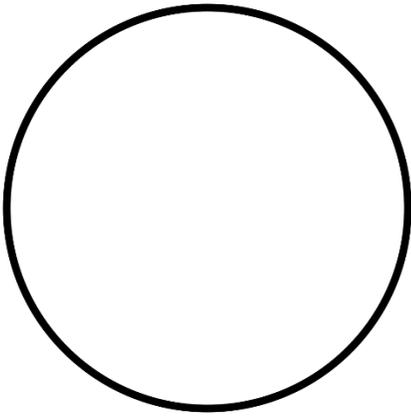
3. The data set below shows the responses to the question "How long did it take you to get to school today (in minutes)?"

5	5	10	10	12	12	12	12	15	15
15	15	15	15	15	17	17	17	20	20
20	20	20	20	22	25	25	26	30	30
30	40	40	40	55	90				

a. How many students were surveyed?

b. What is the mean of the travel times?

c. What is the median of the travel times?

d. What is the mode of the travel times?

e. Which data value was an outlier?

f. Was the mean, the median, or the mode more affected by the outlier?

g. What is the range of the travel times?
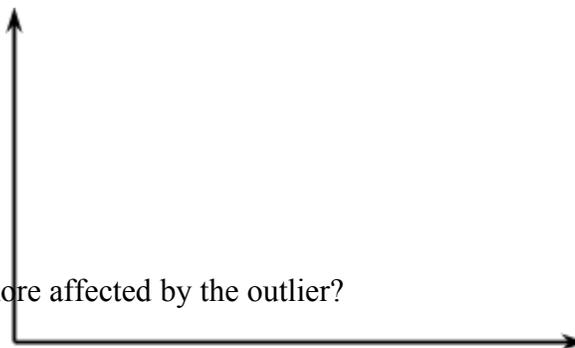
h. Complete the frequency table for this data set, using the class intervals below that start at 0 and are 10 minutes wide. (A person answering "10 minutes" would be counted in the second row, not the first row.)

Time in Minutes	Frequency
0-10	2
10-20	16
20-30	
30-40	
40-50	
50+	2
Total	36

i. Make a histogram (above) to display this data set, using the frequency table. Label both the vertical and the horizontal axis with:
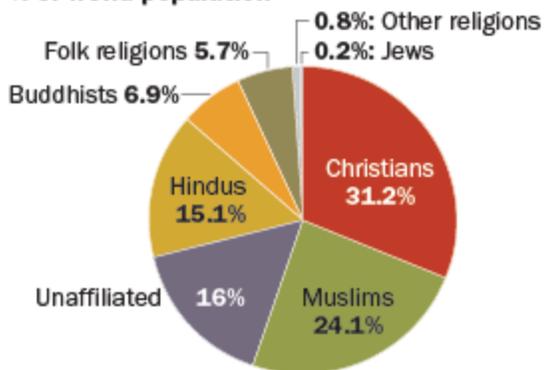- equally spaced tick marks
- numbers
- a word or phrase.
Then draw the the bars for each class interval.

4. You want to draw a graph summarizing the heights (in inches) of a class of students. What type of graph or chart would be best to use: a bar graph, a pie chart, or a histogram? Explain why.
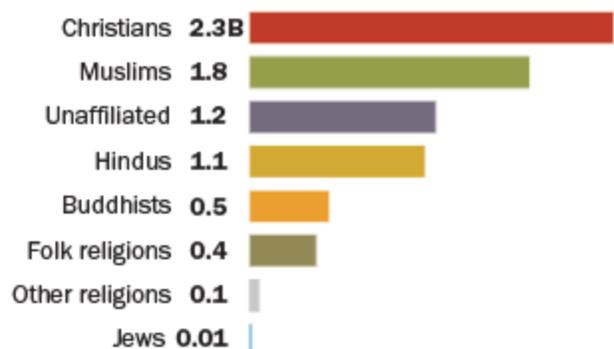
5. The pie chart below shows the distribution of religions in the world[1]. Use it to answer the questions that follow.

Christians are the largest religious group in 2015

% of world population

- 0.8%: Other religions
- 0.2%: Jews
- Folk religions 5.7%
- Buddhists 6.9%
- Hindus 15.1%
- Christians 31.2%
- Unaffiliated 16%
- Muslims 24.1%

Number of people in 2015, in billions

- Christians 2.3B
- Muslims 1.8
- Unaffiliated 1.2
- Hindus 1.1
- Buddhists 0.5
- Folk religions 0.4
- Other religions 0.1
- Jews 0.01

Source: Pew Research Center demographic projections. See Methodology for details.
"The Changing Global Religious Landscape"

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a. What is the total world population based on the bar graph?

[1]

b. When I check the percentages presented, I get close, but not exactly the same values. Use the numbers in the bar graph to calculate the percent of the world's population that is classified as Buddhist.

c. Use the world's population you found in part a, as well as the fact that Folk Religion makes up 5.7% of the world. How many people are counted in the Folk Religion category?

d. Is the bar graph presented a Pareto chart? Explain why or why not.

6. Two data sets are presented below. These represent the ages of statistics students in two classes.

Fall 2018

| 18 | 18 | 18 | 18 | 18 | 18 | 19 | 20 | 20 | 20 | 21 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 28 | 30 | 31 | 33 |

Fall 2019

| 16 | 17 | 17 | 17 | 18 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | 22 | 22 | 23 | 26 | 26 | 26 | 27 | 27 | 28 |
| 30 | 31 | 32 | 38 | 42 |

a. Write two observations based on this data. Write two complete sentences.

b. The standard deviation of the second class is 6.03 years. Do you expect the standard deviation of the first class to be higher or lower?

c. Use the table below to find the standard deviation of the first class. Assume that the data is from a population, not a sample.

Age		
18		
18		
18		
18		
18		
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19		
20		
20		
20		
21		
21		
22		
23		

24		
25		
25		
26		
28		
30		
31		
33		

7. A person said to you "Larger groups will always have larger standard deviations." Do you agree or disagree? Explain your reasoning with an example or a counter-example.

8. Two age distribution histograms are shown below. These are from a Pew Research Center animation that had graphs like this for every 5 years between 1950 and 2060[2]. The bars represent ages in 5 year increments (for example 0-4 yrs, 5-9 years, 10-14 years, etc).
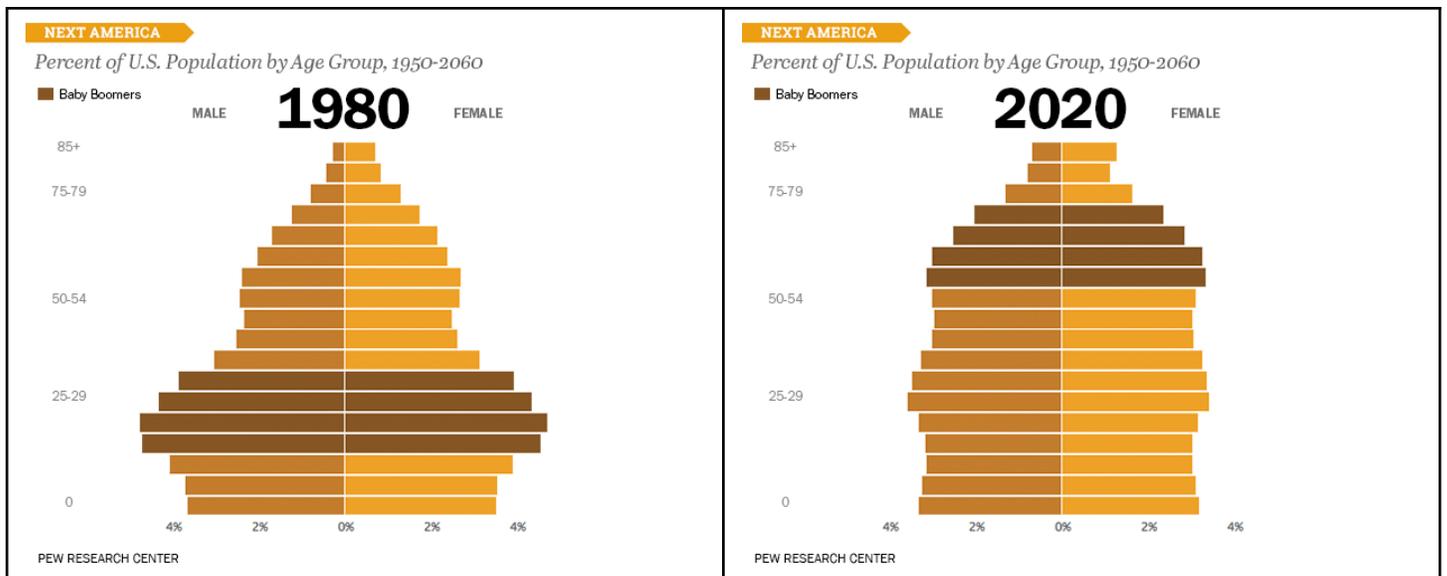
Choose True or False for each statement comparing the U.S. Age distribution in 1980 to 2020.

T   F   a. In 1980, the highest percentage of people are in the age group 20-25.

T   F   b. In 2020 the percent of the population aged 85+ is smaller than it was in 1980.

T   F   c. In 1980 the country as a whole was younger.

T   F   d. In 2020 people are living longer.

T   F   e. In 1980 the country was more uniformly distributed by age.