

Student: _____
Date: _____

Instructor: Andreas Lazari
Course: Math2620 F - Fall 2018

Assignment: Chapter 3.4 and 3.5-
Homework

1. Suppose that your z-score on the first exam is $Z = -1.34$. If the class average is 71.23 with a standard deviation of 8.76, what is your exam grade?

$$Z = \frac{X - \bar{X}}{s} \quad \text{or} \quad Z = \frac{X - \mu}{\sigma}$$

Select the correct choice below.
(Round to two decimal place as needed.)

- A. 79.99
 B. 69.89
 C. 82.97
 D. 59.49

$$\begin{aligned} -1.34 &= \frac{X - 71.23}{8.76} \Rightarrow X - 71.23 = (-1.34)(8.76) \\ &\Rightarrow X = (-1.34)(8.76) + 71.23 \\ &X = 59.4916 \approx 59.49 \end{aligned}$$

2. Suppose that your z-score on the first exam is $Z = 2.5$. If the class average is 67.4 with a standard deviation of 11.5, what is your exam grade?

Select the correct choice below.
(Round to two decimal place as needed.)

- A. 78.9
 B. 96.15
 C. 55.9
 D. 38.65

$$2.5 = \frac{X - 67.4}{11.5}$$

$$\Rightarrow X = (2.5)(11.5) + 67.4 = 96.15$$

3. Suppose babies born after a gestation period of 32 to 35 weeks have a mean weight of 2800 grams and a standard deviation of 900 grams while babies born after a gestation period of 40 weeks have a mean weight of 3200 grams and a standard deviation of 425 grams. If a 32-week gestation period baby weighs 3025 grams and a 41-week gestation period baby weighs 3425 grams, find the corresponding z-scores. Which baby weighs more relative to the gestation period?

Find the corresponding z-scores. Which baby weighs relatively more? Select the correct choice below and fill in the answer boxes to complete your choice.

(Round to two decimal places as needed.)

$$\text{32 week; } Z = \frac{3025 - 2800}{900} = 0.25$$

- A. The baby born in week 41 weighs relatively more since its z-score, 0.53, is larger than the z-score of 0.25 for the baby born in week 32.
- B. The baby born in week 32 weighs relatively more since its z-score, _____, is larger than the z-score of _____ for the baby born in week 41.
- C. The baby born in week 32 weighs relatively more since its z-score, _____, is smaller than the z-score of _____ for the baby born in week 41.
- D. The baby born in week 41 weighs relatively more since its z-score, _____, is smaller than the z-score of _____ for the baby born in week 32.

$$\begin{aligned} \text{41 week;} \\ Z &= \frac{3425 - 3200}{425} \\ &= 0.529411 \\ &\approx 0.53 \end{aligned}$$

Since the z-score of 41 weeks is greater than the z-score of 32 weeks, the baby of the 41 weeks weighs more.

4. In a certain city, the average 20- to 29-year old man is 69.6 inches tall, with a standard deviation of 3.1 inches, while the average 20- to 29-year old woman is 64.5 inches tall, with a standard deviation of 3.9 inches. Who is relatively taller, a 75-inch man or a 70-inch woman?

Find the corresponding z-scores. Who is relatively taller, a 75-inch man or a 70-inch woman? Select the correct choice below and fill in the answer boxes to complete your choice. (Round to two decimal places as needed.)

- A. The z-score for the woman, _____, is larger than the z-score for the man, _____, so she is relatively taller.
- B. The z-score for the man, _____, is smaller than the z-score for the woman, _____, so he is relatively taller.
- C. The z-score for the man, 1.74, is larger than the z-score for the woman, 1.41, so he is relatively taller.
- D. The z-score for the woman, _____, is smaller than the z-score for the man, _____, so she is relatively taller.

Man

$$z = \frac{75 - 69.6}{3.1} = 1.7419 \approx 1.74$$

Woman

$$z = \frac{70 - 64.5}{3.9} = 1.41025 \approx 1.41$$

5. The accompanying data represent the monthly rate of return of a certain company's common stock for the past few years. Determine the quartiles.

¹ Click the icon to view the data table.

(Determine and interpret the quartiles)

The first quartile is $Q_1 = -0.0200$

(Round to four decimal places as needed.)

The second quartile is $Q_2 = 0.0300$

(Round to four decimal places as needed.)

The third quartile is $Q_3 = 0.1000$

(Round to four decimal places as needed.)

Interpret the quartiles. Choose the correct answer below.

- A. Of the monthly returns, 25% are less than or equal to the first quartile, 50% are less than or equal to the second quartile, and 75% are less than or equal to the third quartile.
- B. All monthly returns within one standard deviation of the mean are contained in the first quartile, all monthly returns within two standard deviations of the mean are contained in the second quartile, and all monthly returns within three standard deviations of the mean are contained in the third quartile.
- C. The first quartile is the lower bound of plausible monthly returns, and the third quartile is the upper bound of plausible monthly returns. Any monthly returns outside of these bounds are outliers. The second quartile represents the most common monthly return.
- D. The first quartile is one standard deviation below the mean (or average monthly return), the second quartile is the mean, and the third quartile is one standard deviation above the mean.

1: Rate of Return

0.26	0.26	0.03	0.06	0.06	-0.04	-0.04	0.22
0.48	0.06	-0.14	0.19	0.05	0.18	0.09	0.02
-0.05	-0.02	0.08	0.02	-0.02	0.13	-0.08	-0.02
0.06	-0.01	0.07	-0.05	0.01	-0.10	0.02	0.03
0.01	0.11	-0.11	0.10	0.10	0.25	-0.02	0.03

Enter the data in TI-83/84

6. (a) Identify the shape of the distribution, and (b) determine the five-number summary. Assume that each number in the five-number summary is an integer.



a. Choose the correct answer below for the shape of the distribution.

- A. The distribution is roughly symmetric.
 B. The distribution is skewed left.
 C. The distribution is skewed right.
 D. The shape of the distribution cannot be determined from the boxplot.

b. The five-number summary is 0, 5, 10, 15, 20.

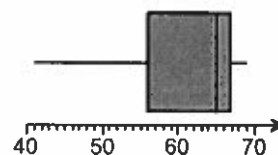
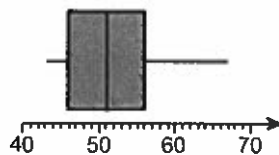
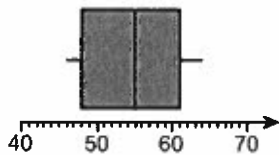
7. The data represent the age of world leaders on their day of inauguration. Find the five-number summary, and construct a boxplot for the data. Comment on the shape of the distribution.

48	50	48	55
46	47	49	64
56	55	61	62
58	52	63	

The five-number summary is 46, 48, 55, 61, 64.

Choose the correct boxplot of the data below.

- A. B. C.



Enter the data in TI 83/84 and build a boxplot.

Choose the correct description of the shape of the distribution.

- A. The distribution is roughly symmetric.
 B. The distribution is skewed to the right.
 C. The distribution is skewed to the left.
 D. The shape of the distribution cannot be determined from the boxplot.

8. The following data represent the dividend yields (in percent) of a random sample of 28 publicly traded stocks. Complete parts (a) to (c).

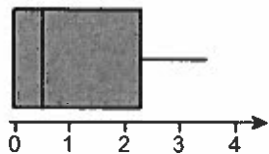
0	0.14	1.2	2.23	0.4	2.96	2.32
0.67	0.4	2.57	0	2.25	3.13	0.21
1.33	3.5	0.36	0.72	2.67	2.96	0
0.31	0	1.3	2.27	0.71	1.66	1.17

(a) Compute the five-number summary.

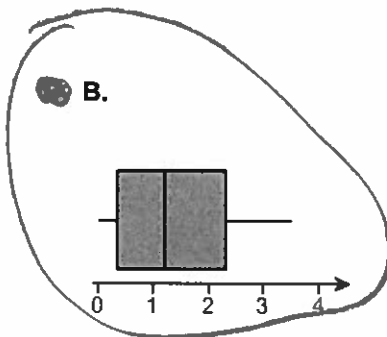
The five-number summary is 0, 0.34, 1.19, 2.3, 3.5.
(Round to two decimal places as needed. Use ascending order.)

(b) Draw a boxplot of the data.

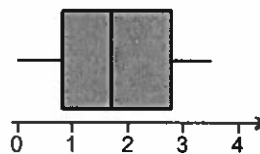
A.



B.



C.



(c) Determine the shape of the distribution from the boxplot.

A. The distribution is roughly symmetric.

B. The distribution is skewed to the left.

C. The distribution is skewed to the right.

D. The shape of the distribution cannot be determined from the boxplot.

1. D. 59.49

2. B. 96.15

3. A.
The baby born in week 41 weighs relatively more since its z-score, 0.53, is larger than the z-score of 0.25 for the baby born in week 32.

4. C.
The z-score for the man, 1.74, is larger than the z-score for the woman, 1.41, so he is relatively taller.

5. - 0.0200

0.0300

0.1000

A.

Of the monthly returns, 25% are less than or equal to the first quartile, 50% are less than or equal to the second quartile, and 75% are less than or equal to the third quartile.

6. A. The distribution is roughly symmetric.

0

5

10

15

20

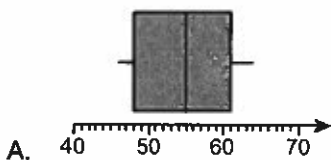
7. 46

48

55

61

64



A. The distribution is roughly symmetric.

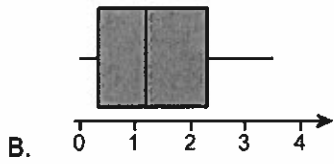
8.0

0.34

1.19

2.3

3.5



C. The distribution is skewed to the right.
