

## Kerry Ojakian's MTH 23.5 Class

**Due Date:** Tuesday October 12 in class

## HW #1

### General Instructions:

- Homework must be relatively neat.
- Homework exercises must be done in order (if you skip an exercise, still write down the number and leave some blank space).
- You must show all work.
- While you may work with other students or tutors, do not copy someone else's work or data, or have someone else do the work for you.

## The Assignment

1. OpenStax Statistics Book: Page 52, 53: Exercises 42 and 46.
2. Choose a random sample of size 5 from among the integers 1 to 100. How did you choose your random sample?
3. Classify each of the following data according to the *level of measurement* (that is state whether it is nominal, ordinal, interval, or ratio):
  - (a) The telephone numbers in a telephone directory.
  - (b) The scores of a class in an exam.
  - (c) Motion Picture Association of America ratings description (G, PG, PG-13, R, NC-17).
  - (d) Average monthly precipitation in inches for New York, NY.
  - (e) Average monthly temperature (in degrees Fahrenheit) for New York, NY.
  - (f) Absolute temperatures (that is temperatures measured in Kelvin degrees).

4. Do the following conversions.

- (a) Convert 0.0587 to a percent.
- (b) Convert 43.765% to a decimal.
- (c) Convert  $21/30$  to a decimal.

5. Simplify the fraction

- (a)  $\frac{28}{12}$
- (b)  $\frac{2}{7}$

6. Calculate the following:

- (a)  $100 \cdot 3 - 2 \cdot 10^2$
- (b)  $|-5 - 2|$

7. Use our class data (available as an Excel file at the webpage under Course Materials, the bottom link “Our Class Data”). From that file use the data from column choose a data column. Make a frequency table with 4 classes, then use this to make a histogram. Make a relative frequency histogram. Show all this work on paper (not using Excel).
8. Showing all the steps, calculate the range, mean, median, mode for the following population data.

47 59 50 56 56 51 53 57 52 49

Use the Excel commands to calculate the variance and standard deviation (rounding to the nearest tenth).

9. A consumer testing service obtained the following mileage (in miles per gallon) in five test runs for three different types of compact cars:

	<b>First Run</b>	<b>Second Run</b>	<b>Third Run</b>	<b>Fourth Run</b>	<b>Fifth Run</b>
<b>Car A</b>	28	32	28	34	30
<b>Car B</b>	31	31	29	29	31
<b>Car C</b>	32	29	28	32	30

- (a) If the manufacturer of Car A wants to advertise that their car performed the best in this test, which measure of central tendency (mean, median or mode) should be used to support their claim?
- (b) Which measure should the manufacturer of Car B use to claim that their car performed best, mean median or mode?
- (c) Which measure should the manufacturer of Car C use to support a similar claim?
10. Suppose we have the following two data sets:
- $X : x_1 = 6, x_2 = -7, x_3 = 6, x_4 = 0, x_5 = 5$
  - $Y : y_1 = 34.9, y_2 = -30, y_3 = -34.9, y_4 = 30$

Evaluate the following:

(a)  $\sum y$

(b)  $(\sum x) / 5$

11. Compute the Sample Variance, Sample Standard Deviation, Population Variance, and Population Standard Deviation of the following data:

$$-2, 4, 0, -5, -2.$$

*You must do this by hand*, by printing out and filling in all parts of the handout “Worksheet for Variance and Standard Deviation” available at the webpage (or you may carefully copy the table onto your paper).

12. (a) If the sample variance is 32, find the exact (and simplified) sample standard deviation.  
(b) If the sample standard deviation is 7, what is the sample variance?
13. Suppose some data has mean 15 and standard deviation 3.
  - (a) Compute a 75% Chebyshev interval for the data.
  - (b) Compute a 88.9% Chebyshev interval for the data.
14. Suppose  $A$  is some event and  $Pr(A) = 4/14$ . Do the following: 1) Write the probability as a reduced fraction, 2) Write the probability as decimal, 3) Write the probability as a percent.
15. OpenStax Statistics Book: Page 216 - Exercises 13, 14.
16. OpenStax Statistics Book: Page 216 - Exercises 18, 20.
17. OpenStax Statistics Book: Page 224 - Exercise 86: Just parts (a), (b), and (c).
18. Perform the operation and simplify

(a)  $\frac{6}{21} \div \frac{8}{7}$

(b)  $\frac{-3}{8} - \frac{1}{6}$