

Homework 9.1: Analyzing Data

Math 3

Directions: Solve each of the following. Show as much work as needed.

1. The heights (in inches) of eight tomato plants are: 36, 45, 52, 40, 38, 41, 50, and 48
a) Find the range, mean, median, and mode(s) of the tomato plant heights.

$\bar{x} = 43.75$ mode = none
med: 43 Range = 16

2. You and your friend have a friendly competition going on about the scores on your math quizzes. Both of your scores for the first five quizzes are given below.

Your quiz scores: 18, 16, 19, 15, 17
Friend's quiz scores: 20, 20, 13, 12, 17

- a) Find the mean, median, and mode of both sets of data.

Your quiz = $\bar{x} = 17$ mode = none
med = 17

Friends = $\bar{x} = 16.4$
med = 17
mode = 20

- b) Do you or your friend have the higher mean? Who has the highest median?

you have higher mean,
medians are the same

3. In which dataset is the median value equal to the mean value?

a) {2, 4, 6, 7, 8}

b) {12, 18, 20, 23, 24}

(C)

c) {16, 17, 18, 19, 20}

d) {50, 60, 65, 75, 85}

4. Below are percentages of all doctorates earned by men and women between 1980 and 1989.

College	Women	Men
Boudoin	45	48
Carleton	38	61
Grinnell	34	47
Middlebury	36	46
Oberlin	20	34
Swarthmore	34	46

- a) What is the difference between the means of the percentages of doctorates earned by women and men?

$\bar{x}_w = 34.5$ $\bar{x}_m = 47$ $47 - 34.5 = 12.5$

- b) What is the difference in the ranges of the percentages of doctorates earned by men and women?

Range_w = 25 Range_m = 27 $27 - 25 = 2$

- c) How much higher is the median of the percentage of doctorates earned by men than the median of the percentage earned by women?

med_w = 35 med_m = 46.5 11.5 % points higher

Directions: Find the mean, median, mode, and range and standard deviation for each problem. For the standard deviation, solve by hand. Check your answer in the calculator.

5. 239, 230, 500, 120, 230

Mean: 263.8 Median: 230 Mode: 230 Range: 380

Standard Deviation: 140.9

$$(239 - 263.8)^2 = 615.04$$

$$(230 - 263.8)^2 = 1142.44 \times 2 = 2284.88$$

$$(500 - 263.8)^2 = 55790.44$$

$$(120 - 263.8)^2 = 20678.44$$

$$S^2 = \frac{79368.8}{4} = 19842.2$$

$$S_x = \sqrt{19842.2} = 140.9$$

6. 32, 54, 87, 12, 30, 72, 13, 49, 80, 72

Mean: 50.1 Median: 51.5 Mode: 72 Range: 75

Standard Deviation: 27.5

$$(32 - 50.1)^2 = 327.61$$

$$(12 - 50.1)^2 = 1451.61$$

$$(13 - 50.1)^2 = 1376.41$$

$$(54 - 50.1)^2 = 15.21$$

$$(30 - 50.1)^2 = 404.01$$

$$(49 - 50.1)^2 = 1.21$$

$$(87 - 50.1)^2 = 1361.61$$

$$2(72 - 50.1)^2 = 959.22$$

$$(80 - 50.1)^2 = 894.01$$

7. 34.9, 23.5, 83.7, 65.8, 34.9, 20

Mean: 43.8 Median: 34.9 Mode: 34.9 Range: 63.7

Standard Deviation: 25.3

$$2(34.9 - 43.8)^2 = 158.42$$

$$(20 - 43.8)^2 = 566.44$$

$$(23.5 - 43.8)^2 = 412.09$$

$$(83.7 - 43.8)^2 = 1592.01$$

$$(65.8 - 43.8)^2 = 484$$

$$S_x = \sqrt{\frac{3212.96}{5}} = 25.3$$

$$S_x = \sqrt{\frac{6790.9}{9}} = 27.5$$

8. You scored an 65%, 84%, 75%, and 95% on your last four math tests. If you want to earn an 85% in the class, what score must you get on your next math test?

$$\frac{65 + 84 + 75 + 95 + x}{5} = 85$$

$$319 + x = 425$$

$$x = 106\%$$

9. You scored a 88%, 76%, 62%, and 89% on your last four science tests. If your next test counts twice, is it possible to average a 85%?

$$\frac{88 + 76 + 62 + 89 + 2x}{6} = 85$$

$$2x = 195$$

$$x = 97.5\%$$

$$315 + 2x = 510$$