

Mth 23, Homework 5 on Sections 4.1, 5.1

Due by Wed, Oct 7.

Please use lots of space and explain your answers, showing clearly any work you had to do. Each question is worth 3 points.

Section 4.1 Scatter Diagrams and Linear Correlation

- (1) For this paired data, x is the explanatory variable and y is the response variable:

x	10	25	30	40	50
y	4	2	3	2	1

- (a) Make a scatter diagram for this data.
- (b) From your picture do you think the data is positively correlated, negatively correlated or not correlated?
- (c) Estimate the correlation coefficient r .
(No need to compute it, your answer should be between -1 and 1 .)

- (2) A widely reported 2012 paper in the New England Journal of Medicine claimed that eating chocolate increases brain function. The data to support this was based on a positive correlation in countries around the world between the amount of chocolate eaten per person and the number of Nobel Prize winners.

The data given and the correlation were correct. Do you think the conclusion that eating chocolate increases brain function is necessarily true? Explain.

- (3) Draw a scatter diagram for the following sample data where x is family size and y is the number of pets they own

x	2	3	4	5	6
y	2	1	3	2	3

- (4) (a) Compute the correlation coefficient r for the data in Question 3 by first filling in this table and adding its columns:

x	y	x^2	y^2	xy

Put the column totals into the correlation coefficient formula, showing your steps.

- (b) Describe in words the type of correlation you have found and interpret the results.

Section 5.1 What is Probability?

- (5) Say how likely these events A , B , C and D are, or if something is not correct:
- (a) $P(A) = 1$
 - (b) $P(B) = 0.05$
 - (c) $P(C) = 1.2$
 - (d) $P(D) = 80\%$
- (6) A clinical trial of a drug found that 348 out of 510 patients were cured.
- (a) Find the probability that a similar patient will be cured by this drug. Give your answer as a decimal and a percent.
 - (b) What is the probability that a patient will not be cured? (That's the complementary event.)
- (7) In your statistics class of 32 students, the professor randomly picks a student to explain a homework question at the board. What is the probability it is you? Is it likely or unlikely that you will be picked?
- (8) You are going to roll a die once and see which number 1 – 6 comes up. Find the probabilities of these events, giving your answer as a fraction and a decimal:
- (a) Rolling a 4.
 - (b) Rolling a number greater than 2.
 - (c) Rolling a 7.

If you're stuck on a question:

- Ask me about it after class.
- Come to my office hours: Mon 12:00 - 1:00, Wed 12:00 - 1:00 in CP 317.
- Go to the Math Tutorial Lab in-person in CP 303 or online.

Note – If I don't have time to grade every question then I will just grade two random ones. Then your score will be awarded as follows

- First graded question: 25%
- Second graded question: 25%
- You provided answers to all questions: 25%
- Homework was done neatly and submitted on time: 25%