Third set of Problems.

1. We roll a 10 sided die and obtained the following:

Value obtained	1	2	3	4	5	6	7	8	9	10
Frequency	10	9	11	10	7	8	16	10	9	10

   Is the die fair?

2. We did an opinion poll on the colour preferences. We sorted the results with respect to colour preference and age and got the following table:

	blue	red	yellow	black	white	green
below 35	181	185	167	167	174	126
above 35	359	307	350	304	361	319

   Is the colour preference independent of the age?

3. Consider the following data:

Number of hours	3	5	10	30	40	12
Score	8.26	12.37	24.85	74.36	99.63	30.32

   The data represents the number of hours spent by several students and the gradings they got in the final exam.
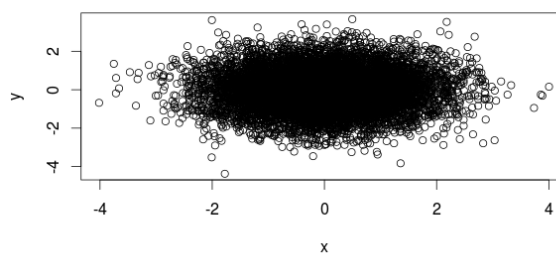
   Answer the following questions:

   - Compute the covariance, the correlation coefficient and the coefficients of the linear regression.

   - Is the data correlated or not? Perform a hypothesis test on the correlation coefficient.

   - Compute confidence intervals for the coefficients of the linear regression.

   - A student is planning to study 22 hours. Give a confidence interval for the expected grading he will get.
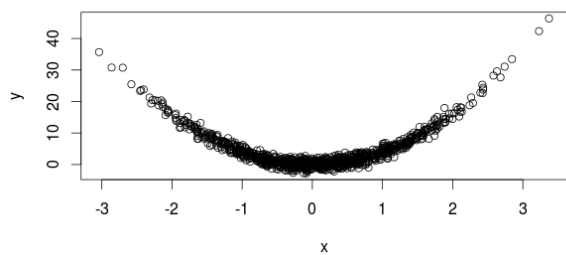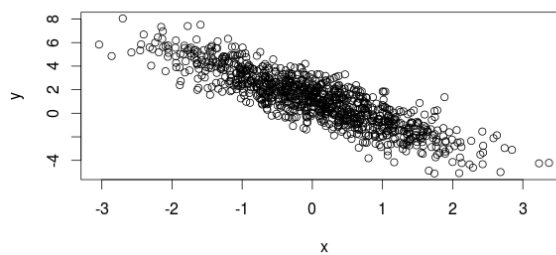
4. Consider the following scatter plots.
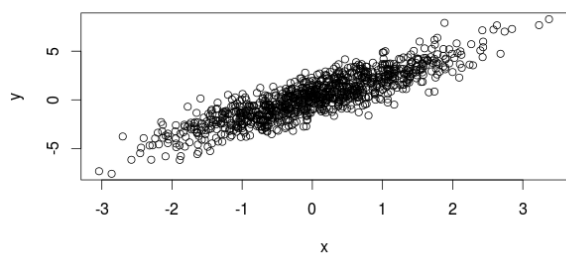
a)

b)

c)

d)

Answer the following question for each of the figures.

- Is there any dependence between the x and y variables?
- Could you tell if the correlation coefficient is positive, negative, or zero?
- If you think that the data is correlated, sketch an approximation of the linear regression line.