1) The nominal fuel consumption of a car is 6.7 l on 100 km. The variance of fuel consumption is 0.215 l^2. You use a test car for driving 100 km and the fuel consumption is 7.3 l.

(a) Why does the fuel consumption have a variance? (Why isn't it constant?)

(b) Is there evidence to conclude that the average fuel consumption of this car is above 6.7 l? Use α=0.01 significance level.

The car is used for another 4 days. The fuel consumption on these days on 100 km: 6.8, 6.9, 7.6, 7.9.

(c) Knowing these results (don't forget the 7.3 l from the first day!) is there evidence to conclude that the average fuel consumption of this car is above 6.7 l? Use α=0.01 significance level.

(d) Why did we come to different conclusion in part (c) and in part (b)?

(e) What would be the conclusion if t-test was used in part (c)? Which conclusion should be used in practice in your opinion? Why?

2) The fuel consumption of a test car is measured on 100 km. The results: 7.3, 6.8, 6.9, 7.6, 7.9. Is there evidence to support the claim that the variance of fuel consumption is below 0.25 l^2? Use α=0.05 significance level.

3) The fuel consumption of two different test car is measured on 100 km. The results:

Car 1	6,8	6,9	7,6	7,3	7,9
Car 2	7,5	7,3	7,6	7,7	8,1

b) Test the hypothesis that the variance of fuel consumption is the same for both cars! Use α=0.05 significance level.

a) Test the hypothesis that both cars have the same mean fuel consumption! Use α=0.05 significance level.