Mathematics Applications
YEAR 12

Investigation 1 – The Statistical Investigation Process

Semester 1 2017

Validation Test

Time allowed: 50 minutes

Marks Available: 18 marks

Materials required: Writing implements, correction fluid/tape or eraser, ruler, CAS calculator

Instructions:

1. Write your answers in the spaces provided in this Question/Answer Booklet.
2. **Show all your working clearly**. Your working should be in sufficient detail to allow your answers to be checked readily and for marks to be awarded for reasoning. Incorrect answers given without supporting reasoning cannot be allocated any marks. For any question or part question worth more than two marks, valid working or justification is required to receive full marks. If you repeat an answer to any question, ensure that you cancel the answer you do not wish to have marked.

1. (8 marks)
The table below shows the hours spent by a sample of 20 high school students watching television and doing homework in a week.

Hours watching TV	4	5	5	0	9	6	20	4
Hours of homework	10	5	1	2	3	7	9	4
Hours watching TV	6	2	40	5	1	8	17	2
Hours of homework	4	1	1	1	1	10	20	1
Hours watching TV	13	1	14	14				
Hours of homework	14	6	0	9				

Some people feel that TV is a distraction to young high school students; in fact, they would claim, 'the more hours spent by a student watching television, the less hours the student will spend doing homework'.

Complete the following questions and use these data to comment on the above statement.

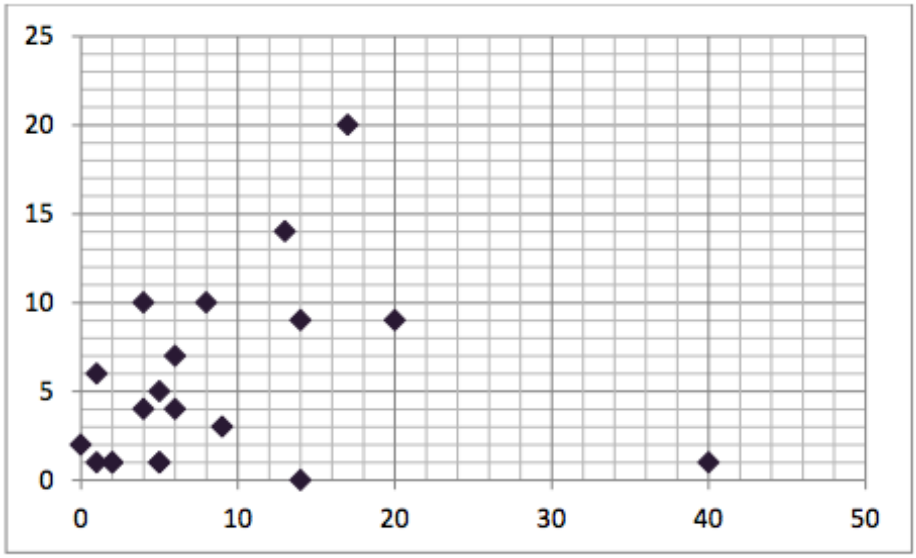
(a) Decide which is the explanatory variable and which is the response variable in the above comment. [2]

(b) Calculate the statistical measures you will use to decide whether the proposition is reasonable or not. [2]

(c) Use your measures from (b) to comment on the proposition,

'the more hours spent by a student watching television, the less hours the student will spend doing homework'. [4]

2. (10 marks)
The diagram below is the scatter plot for the sample in the table above.



(a) Label the axes and draw the regression line from 1(b) on the graph. [3]

(b) Calculate the equation of the linear regression line, using the variables defined here: Hours watching TV = t and Hours of Homework = w [4]

(c) Using the line of best fit in (b), calculate the residual for the student who watched 17 hours of TV and spent 20 hours doing homework. [3]

End of Validation Test