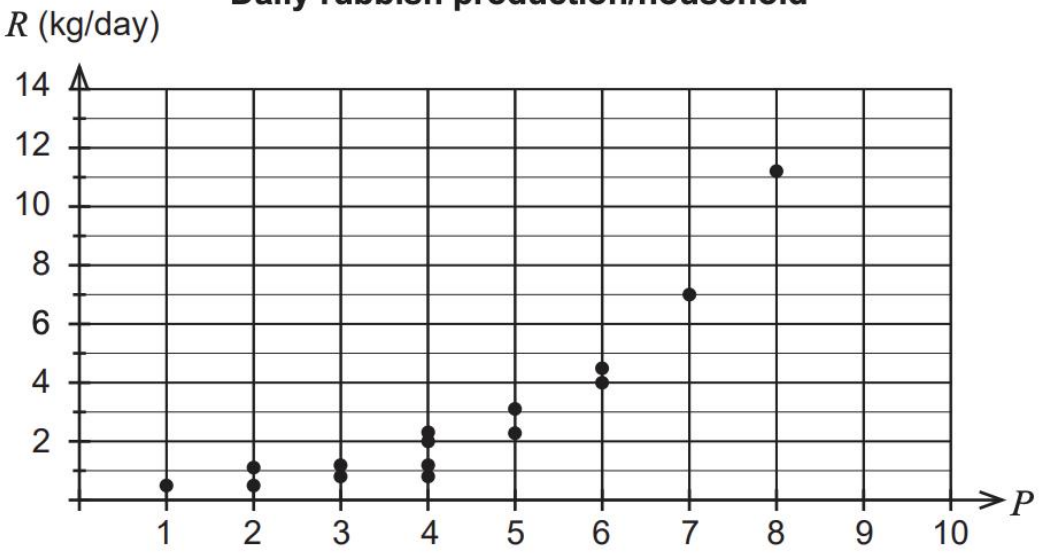
Question 3 **(9 marks)**

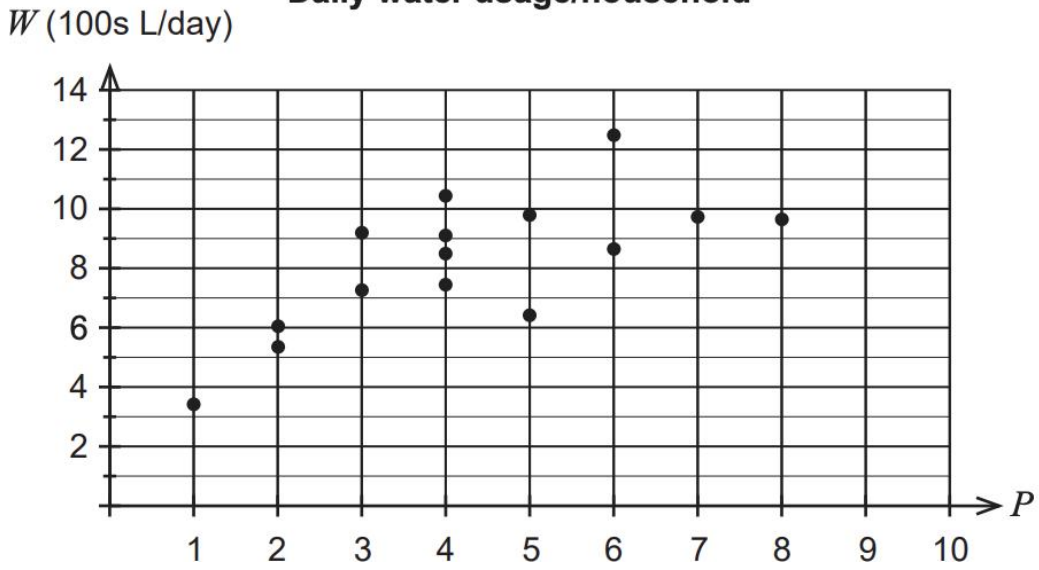
A local council wanted to determine whether the number of people/household, P, affected the amount of household rubbish (R, kg/day) produced and/or water (W, 100s L/day) used.

The graphs below illustrate the data recorded for 15 households within the local council area.

Daily rubbish production/household



Daily water usage/household



(a) Describe the association between the number of people/household, P, and the daily rubbish production/household, R, in terms of strength and form. (2 marks)

(b) It was found that approximately 49% of the variation in daily water usage, W, could be explained by the variation in the number of people/household, P. Determine the correlation coefficient (r_{PW}). (1 mark)

(c) The equation of the least-squares line for the graph showing daily water usage/household is $W = 0.83P + 4.7$.

(i) Interpret the slope of this line. (2 marks)

(ii) Predict the daily water usage for a household with 10 people. Comment on the likelihood of this being a valid prediction and justify your answer. (3 marks)

(d) The council argued that increasing the number of people/household causes the daily water usage to increase. Provide a non-causal explanation for the association between these two variables. (1 mark)