2. A biologist records the length, y cm, and the weight, w kg, of 50 rabbits.
The following summary statistics are calculated from these data.

$$\sum y = 2015 \quad \sum y^2 = 81938.5 \quad \sum w = 125 \quad S_{ww} = 72.25 \quad S_{yw} = 219.55$$

(a) (i) Show that $S_{yy} = 734$

(ii) Calculate the product moment correlation coefficient for these data.
Give your answer to 3 decimal places.

(3)

(b) Interpret your value of the product moment correlation coefficient.

(1)

The biologist believes that a linear regression model may be appropriate to describe these data.

(c) State, with a reason, whether or not your value of the product moment correlation coefficient is consistent with the biologist's belief.

(1)

(d) Find the equation of the regression line of w on y, giving your answer in the form $w = a + by$

(4)

Jeff has a pet rabbit of length 45 cm.

(e) Use your regression equation to estimate the weight of Jeff's rabbit.

(2)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Question 2 continued

Question 2 continued

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Question 2 continued

(Total for Question 2 is 11 marks)