2. Two students, Olive and Shan, collect data on the weight, w grams, and the tail length, t cm, of 15 mice.

Olive summarised the data as follows

$S_{tt} = 5.3173$ $\quad \sum w^2 = 6089.12$ $\quad \sum tw = 2304.53$ $\quad \sum w = 297.8$ $\quad \sum t = 114.8$

(a) Calculate the value of S_{tw} and the value of S_{ww}

(3)

(b) Calculate the value of the product moment correlation coefficient between w and t

(2)

(c) Show that the equation of the regression line of w on t can be written as

$$w = -16.7 + 4.77t$$

(3)

(d) Give an interpretation of the gradient of the regression line.

(1)

(e) Explain why it would not be appropriate to use the regression line in part (c) to estimate the weight of a mouse with a tail length of 2 cm.

(2)

Shan decided to code the data using $x = t - 6$ and $y = \frac{w}{2} - 5$

(f) Write down the value of the product moment correlation coefficient between x and y

(1)

(g) Write down an equation of the regression line of y on x
You do not need to simplify your equation.

(1)

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(Total for Question 2 is 13 marks)