1. A biologist is studying horses.

The biologist records the height, h cm, and the weight, w kg, of 8 horses.

The table below shows the biologist's results.

Height	140	145	150	157	138	140	148	142
Weight	500	521	539	554	492	497	532	525

[You may use $\sum h = 1160$ $\sum w = 4160$ $\sum hw = 604135$ $\sum w^2 = 2166\,600$ $S_{hh} = 286$]

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

(3)

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

(2)

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

$$w = 46.0 + 3.27h$$

where the values of the intercept and gradient are given to 3 significant figures.

(3)

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

(1)

Using the equation of the regression line in part (c), estimate the weight of a horse with a height of

(e) (i) 153 cm

(ii) 170 cm

(2)

(f) State, giving a reason, which of the two estimates found in part (e) would give the more reliable estimate.

(1)

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Question 1 continued

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Question 1 continued

(Total for Question 1 is 12 marks)