Correlation - Questions

1.

1. A clothes shop manager records the weekly sales figures, £ s, and the average weekly temperature, t °C, for 6 weeks during the summer. The sales figures were coded so that

$$w = \frac{s}{1000}$$

The data are summarised as follows

$$S_{ww} = 50 \qquad \sum wt = 784 \qquad \sum t^2 = 2435 \qquad \sum t = 119 \qquad \sum w = 42$$

(a) Find S_{wt} and S_{tt}

(3)

(b) Write down the value of S_{ss} and the value of S_{st}

(2)

(c) Find the product moment correlation coefficient between s and t.

(2)

The manager of the clothes shop believes that a linear regression model may be appropriate to describe these data.

(d) State, giving a reason, whether or not your value of the correlation coefficient supports the manager's belief.

(1)

(e) Find the equation of the regression line of w on t, giving your answer in the form $w = a + bt$

(3)

(f) Hence find the equation of the regression line of s on t, giving your answer in the form $s = c + dt$, where c and d are correct to 3 significant figures.

(2)

(g) Using your equation in part (f), interpret the effect of a 1°C increase in average weekly temperature on weekly sales during the summer.

(1)