5. The table below shows some summary statistics for 10 pairs of bivariate observations, based on 2 variables x and y

	Mean	**Variance**
x	163.5	148.05
y	61.5	205.25

(a) (i) Show that $\sum x^2 = 268\,803$

(ii) Find the value of $\sum y^2$

(3)

Given that $\sum xy = 102\,230$

(b) (i) show that $S_{yy} = 2052.5$

(ii) find the value of S_{xy}

(3)

Given also that $S_{xx} = 1480.5$

(c) calculate the value of the product moment correlation coefficient for these data.

(2)

(d) Describe what your answer to part (c) suggests about the relationship between x and y

(1)

Another piece of data, $x = 163.5$ and $y = 61.5$, is now included with the other 10 bivariate observations.
The product moment correlation coefficient for these 11 bivariate observations, T, is calculated.

(e) **Without further calculation**, state how the value of T will compare with the answer to part (c).
Give a reason for your answer.

(2)

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