

1. A bank reviews its customer records at the end of each month to find out how many customers have become unemployed, u , and how many have had their house repossessed, h , during that month. The bank codes the data using variables $x = \frac{u-100}{3}$ and $y = \frac{h-20}{7}$

The results for the 12 months of 2009 are summarised below.

$$\sum x = 477 \quad S_{xx} = 5606.25 \quad \sum y = 480 \quad S_{yy} = 4244 \quad \sum xy = 23070$$

- (a) Calculate the value of the product moment correlation coefficient for x and y. (3)
- (b) Write down the product moment correlation coefficient for u and h. (1)

The bank claims that an increase in unemployment among its customers is associated with an increase in house repossessions.

- (c) State, with a reason, whether or not the bank's claim is supported by these data. (2)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Solutions

1a.

$S_{xy} = 23070 - \frac{477 \times 480}{12} = 3990$	M1
$r = \frac{3990}{\sqrt{5606.25 \times 4244}}$	M1
$r = 0.81799\dots$ $r = 0.818$	M1

1b.

0.818	M1
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1c.

Positive correlation	M1
So, there is support for the bank's claim	M1

