

3 The back-to-back stem-and-leaf diagram shows the annual salaries, in dollars, of 27 employees at each of two companies, Browns and Greens.

| Browns |       |   |   |   |   |   |   |    | Greens |   |     |     |     |     |     |   |     |
|--------|-------|---|---|---|---|---|---|----|--------|---|-----|-----|-----|-----|-----|---|-----|
| (3)    | 9 8 4 |   |   |   |   |   |   | 30 | 6      | 8 | (2) |     |     |     |     |   |     |
| (7)    | 8     | 8 | 5 | 3 | 3 | 1 | 0 | 31 | 2      | 4 | 5   | 8   | (4) |     |     |   |     |
| (7)    | 9     | 7 | 6 | 4 | 2 | 2 | 0 | 32 | 3      | 6 | 6   | 7   | 9   | (5) |     |   |     |
| (6)    | 8 7 5 |   |   |   | 5 | 3 | 1 | 33 | 1      | 1 | 3   | 7   | 8   | 8   | 9   | 9 | (8) |
| (3)    |       |   |   |   | 4 | 2 | 2 | 34 | 0      | 2 | 3   | 5   | 6   | 9   | (6) |   |     |
| (1)    |       |   |   |   |   |   |   | 7  | 35     | 3 | 7   | (2) |     |     |     |   |     |

Key: 6|32|7 means \$32 600 for Browns and \$32 700 for Greens.

(a) Find the median and interquartile range for the annual salaries of employees at Browns. [3]

The annual salary of an employee at Browns is denoted by  $x$  thousand dollars and the annual salary of an employee at Greens is denoted by  $y$  thousand dollars. It is given that, for the 27 employees at each of the companies,

$\sum x = 878.3, \sum x^2 = 28\,616.09, \sum y = 896.5, \sum y^2 = 29\,815.63.$

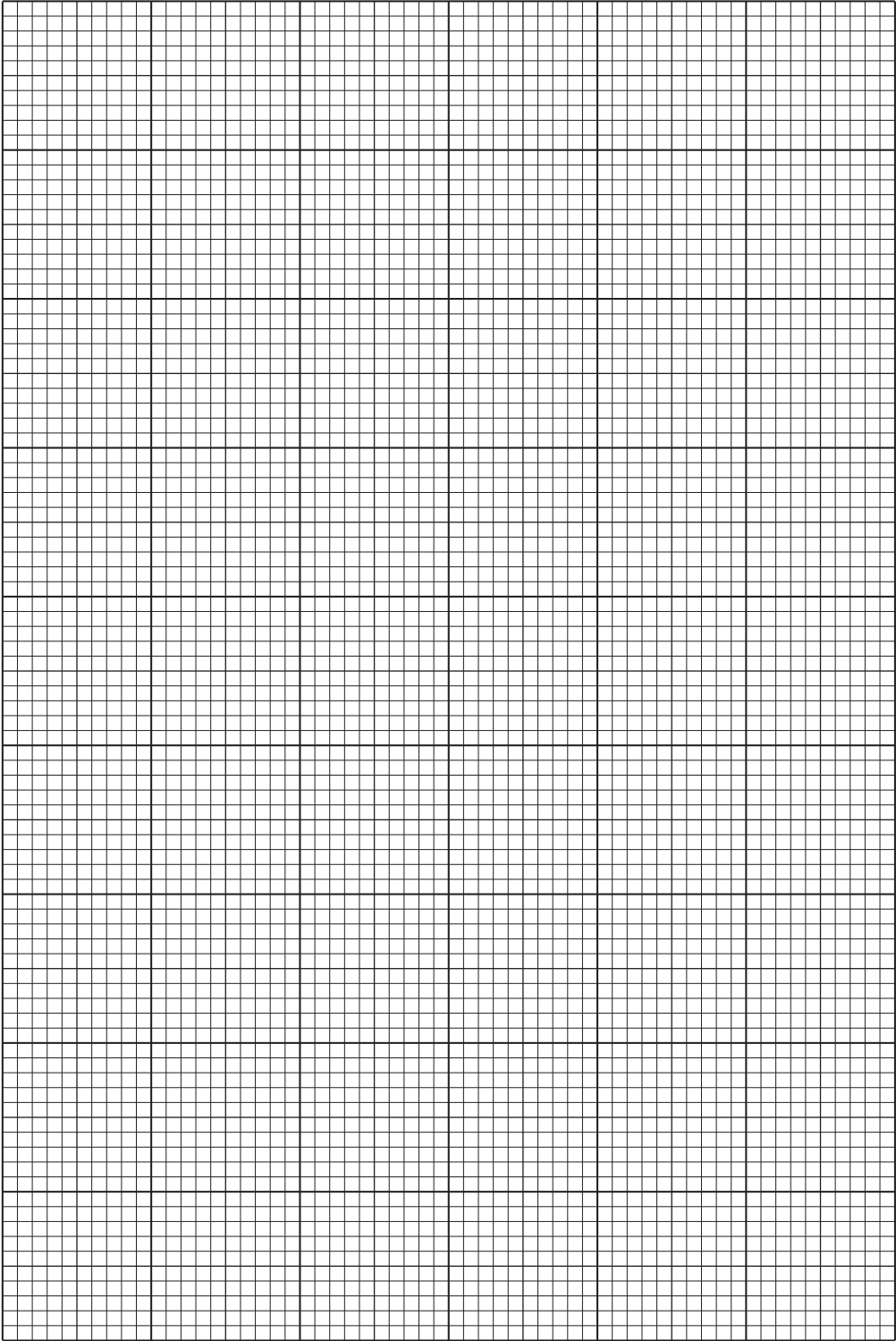
(b) Find the mean and standard deviation of the annual salaries of these 54 employees. [5]

5 The times of 240 competitors taking part in an event are recorded correct to the nearest minute. The results are summarised in the table.

|                |        |         |         |         |         |
|----------------|--------|---------|---------|---------|---------|
| Time (minutes) | 1 – 10 | 11 – 20 | 21 – 25 | 26 – 30 | 31 – 50 |
| Frequency      | 12     | 38      | 68      | 76      | 46      |

(a) Draw a histogram to represent this information.

[4]



**(b)** Calculate an estimate of the mean time taken by the 240 competitors.

[3]

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3 Last Sunday, teams of runners took part in a charity event. The time taken, in seconds, to run 50m was recorded, correct to 1 decimal place, for each runner. The times recorded for 11 runners from each of the Gulls and the Herons are shown in the table.

|        |     |     |     |     |     |      |     |     |     |      |      |
|--------|-----|-----|-----|-----|-----|------|-----|-----|-----|------|------|
| Gulls  | 7.9 | 8.2 | 8.3 | 8.6 | 8.6 | 8.8  | 9.2 | 9.7 | 9.8 | 10.0 | 10.4 |
| Herons | 9.5 | 9.9 | 8.5 | 8.1 | 9.2 | 10.8 | 8.3 | 9.7 | 9.3 | 9.9  | 8.7  |

- (a) Draw a back-to-back stem-and-leaf diagram to represent this information, with Gulls on the left-hand side. [4]

- (b) Find the median and the interquartile range of the times of the runners from the Gulls. [3]

Two other teams of runners, the Eagles and the Swifts, also took part in the event. The recorded times in seconds for 20 runners from the Eagles and 30 runners from the Swifts are denoted by  $x$  and  $y$  respectively.

It is given that  $\sum x = 175.0$  and that the mean of  $y$  is 8.4.

**(c)** Find the mean of the times taken by all 50 runners. [2]

It is given that  $\sum x^2 = 1823.0$ .

It is also known that the standard deviation of the times taken by all 50 runners is 1.38 seconds.

**(d)** Find the value of  $\sum y^2$ , correct to 1 decimal place. [3]