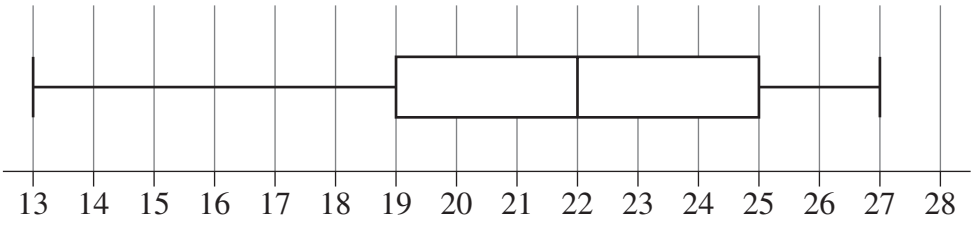
**Question 36** (5 marks)

A cricket is an insect. The male cricket produces a chirping sound. **5**

A scientist wants to explore the relationship between the temperature in degrees Celsius and the number of cricket chirps heard in a 15-second time interval.

Once a day for 20 days, the scientist collects data. Based on the 20 data points, the scientist provides the information below.

- A box-plot of the temperature data is shown.




- The mean temperature in the dataset is 0.525°C below the median temperature in the dataset.

- A total of 684 chirps was counted when collecting the 20 data points.

The scientist fits a least-squares regression line using the data $(x, y)$, where $x$ is the temperature in degrees Celsius and $y$ is the number of chirps heard in a 15-second time interval. The equation of this line is

$$y = -10.6063 + bx,$$

where $b$ is the slope of the regression line.

The least-squares regression line passes through the point $(\overline{x}, \overline{y})$ where $\overline{x}$ is the sample mean of the temperature data and $\overline{y}$ is the sample mean of the chirp data.

**Question 36 continues on page 41**

Question 36 (continued)

Calculate the number of chirps expected in a 15-second interval when the temperature is 19° Celsius. Give your answer correct to the nearest whole number.

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**End of Question 36**

**Please turn over**