

IEB Statistics practice — Questions

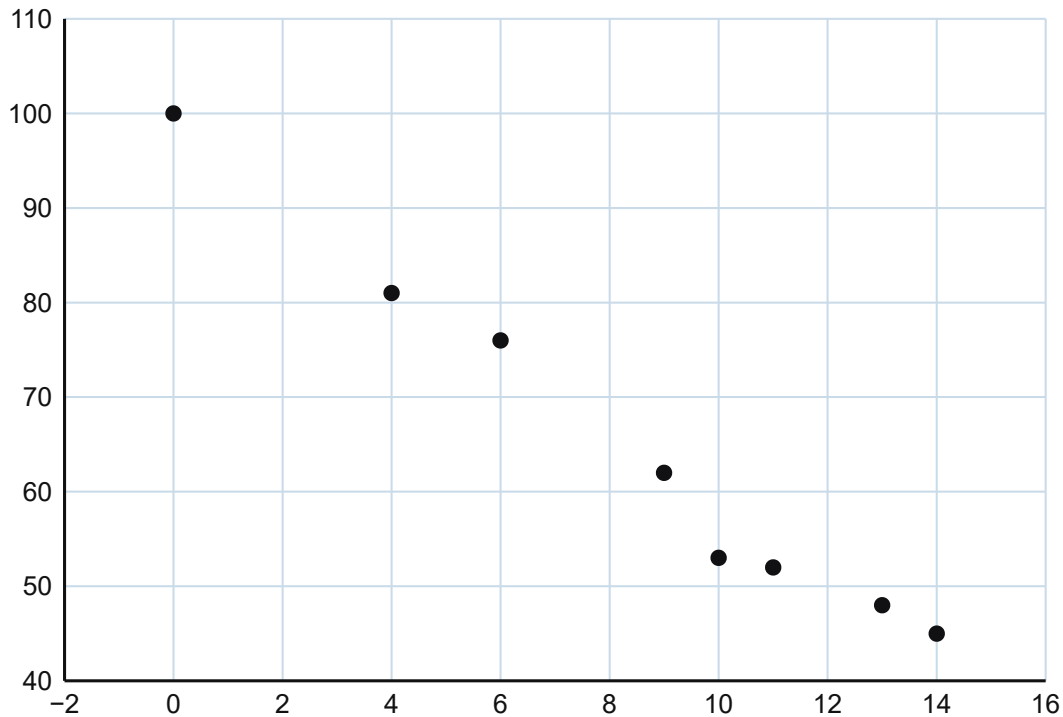
6 newly generated questions across all 13 statistics topics the IEB examines in Paper II — 69 marks in all. Every answer is worked in the memorandum booklet. Nothing here is taken from a past paper.

The least-squares line of best fit

1

[10]

The table and scatter plot show the number of absences in a term (x) and a learner's mark out of 100 (y): (0; 100); (4; 81); (6; 76); (9; 62); (10; 53); (11; 52); (13; 48); (14; 45).



- (a) Use your calculator to determine the equation of the least squares regression line (3)
in the form $y = A + Bx$. Give A and B correct to three decimal places.

Answer: _____

- (b) Determine the correlation coefficient r , correct to two decimal places. (1)

Answer: _____

- (c) Describe the strength and direction of the correlation. (2)

Answer: _____

- (d) Use your equation to predict y when $x = 5$. (2)

Answer: _____

(e) Is this prediction reliable? Explain.

(2)

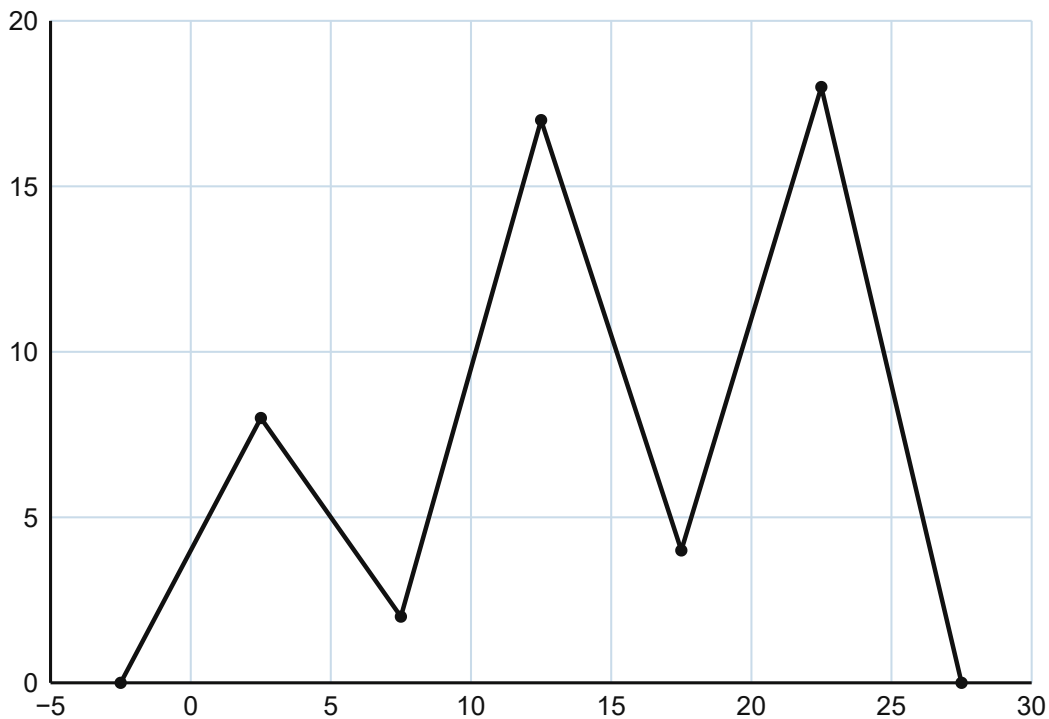
Answer: _____

The estimated mean of grouped data

2

[15]

The frequency polygon shows the mass in kg of 49 parcels, grouped in the classes $0 \leq x < 5$; $5 \leq x < 10$; $10 \leq x < 15$; $15 \leq x < 20$; $20 \leq x < 25$.



(a) Estimate the mean of the data. (3)

Answer: _____

(b) Write down the modal class. (1)

Answer: _____

(c) Draw an ogive (cumulative frequency curve) for the data. (4)

Answer: _____

(d) Use your ogive to estimate the median. (2)

Answer: _____

(e) Use your ogive to estimate the interquartile range. (3)

Answer: _____

(f) Is the data skewed? Explain, using the mean and the median. (2)

Answer: _____

3

[10]

The table shows the time in minutes that 40 people waited at a clinic. One frequency is unknown.

- $0 \leq x < 10$: frequency 15
- $10 \leq x < 20$: frequency 11
- $20 \leq x < 30$: frequency 4
- $30 \leq x < 40$: frequency 5
- $40 \leq x < 50$: frequency x

(a) The estimated mean is 18.5. Determine the value of x . (3)

Answer: _____

(b) Write down the modal class. (1)

Answer: _____

(c) In which class does the median lie? (2)

Answer: _____

(d) Complete the cumulative frequencies and draw the ogive. (4)

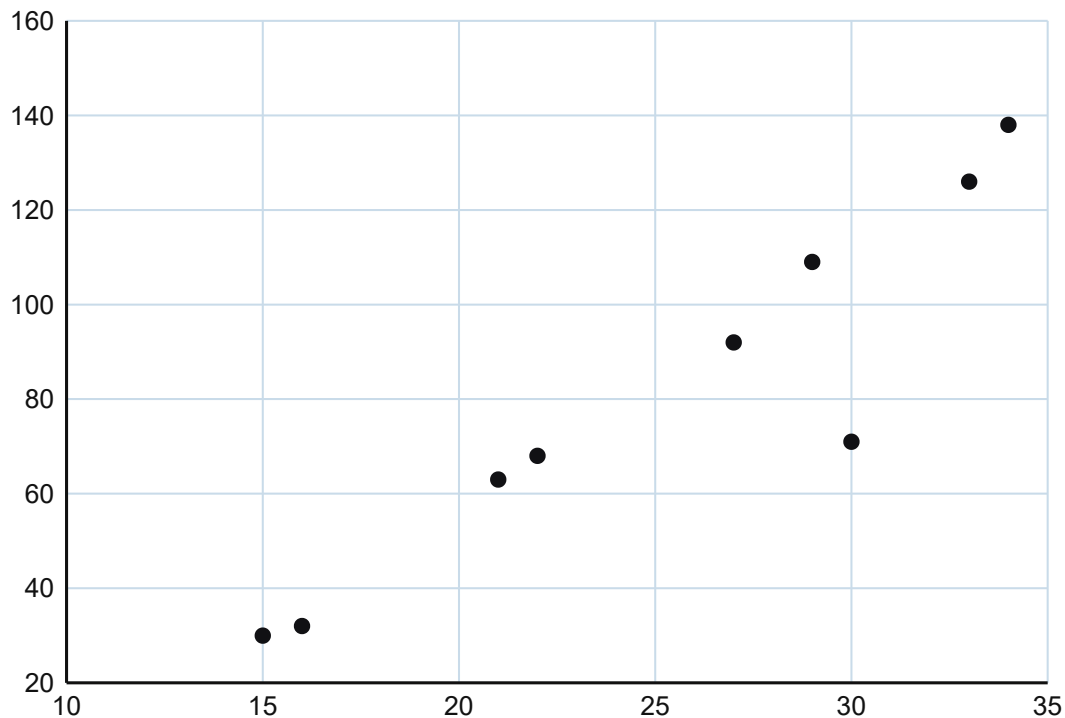
Answer: _____

Scatter plots

4

[9]

The scatter plot shows the midday temperature in $^{\circ}\text{C}$ (x) and the number of ice creams a shop sold (y): (15; 30); (16; 32); (21; 63); (22; 68); (27; 92); (29; 109); (30; 71); (33; 126); (34; 138).



- (a) Identify the outlier in the data. (1)

Answer: _____

- (b) The outlier is removed. Determine the equation of the least squares regression line for the remaining data, in the form $y = A + Bx$, with A and B correct to three decimal places. (3)

Answer: _____

- (c) Determine the correlation coefficient r of the remaining data, correct to two decimal places. (1)

Answer: _____

- (d) By how much does y change, on average, for each increase of 1 in x ? Use your equation. (2)

Answer: _____

- (e) Did the outlier make the correlation stronger or weaker? Explain. (2)

Answer: _____

Mean, median and mode

5

[15]

The data below gives the daily rainfall in mm on 12 days: 8; 14; 15; 15; 16; 17; 20; 21; 21; 25; 28; 31

- (a) Calculate the mean. (1)

Answer: _____

- (b) Calculate the standard deviation, correct to two decimal places. (2)

Answer: _____

- (c) How many of the values lie within one standard deviation of the mean? (2)

Answer: _____

- (d) Write down the five-number summary. (3)

Answer: _____

- (e) Draw a box-and-whisker plot of the data. (2)

Answer: _____

- (f) An outlier is a value more than $1.5 \times \text{IQR}$ above Q3 or below Q1. Is 31 an outlier? (3)
Show your working.

Answer: _____

- (g) Every value is increased by 10. What happens to the mean and to the standard deviation? (2)

Answer: _____

The 7 values below give the daily rainfall in mm on 7 days, in ascending order: 5; $x + 4$; $x + 5$; $x + 10$; $x + 18$; $x + 19$; $x + 22$.

-
- (a) The median is 29. Determine the value of x . (2)

Answer: _____

-
- (b) Calculate the mean. (2)

Answer: _____

-
- (c) Calculate the standard deviation, correct to two decimal places. (2)

Answer: _____

-
- (d) How many of the values lie more than one standard deviation above the mean? (2)

Answer: _____

-
- (e) The highest value is increased by 10. Which of the mean, the median and the standard deviation change? (2)

Answer: _____