

GCSE MATHS

Sampling and scatter graphs

Worked Solutions

Q1

★

(a) All pupils at the school

The population is the whole group of interest.

(b) 60

Only the pupils asked belong to this sample.

Q2

★★

Only one interest group is represented

Its preferences may differ from those of the whole school.

Q3

★★

Participation is self-selected

The volunteers may differ from the visitors who do not respond.

Q4

★★

No

A larger sample can still leave out the same groups of people.

Q5

★★

Use neutral wording

Remove praise and the suggestion that agreement is expected.

Q6

★★

1, 2, ..., 500

Give every pupil a unique number.

Choose 20 distinct random numbers

Select the matching pupils; ignore repeats.

Q7

★★

Equal chance for every pupil

Selecting by arrival time may favour particular groups.

Q8

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$$14/40 \times 100 = 35\%$$

Use the proportion in the sample.

Q9

$$50 \left(\frac{120}{300} \right) = 20$$

Use Year 10's fraction of the population.

Q10

$$80 \left(\frac{180}{600} \right) = 24$$

Allocate the first group.

$$80 \left(\frac{150}{600} \right) = 20$$

Allocate the second group.

$$80 \left(\frac{270}{600} \right) = 36$$

Allocate the third; check the total is eighty.

Q11

Other times are missing

Include customers visiting on different days and at different times.

Q12

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Positive correlation

Larger x -values tend to go with larger y -values.**Q13**

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Negative correlation

One variable tends to decrease as the other increases.

Q14

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No

Other factors could influence both variables.

Q15

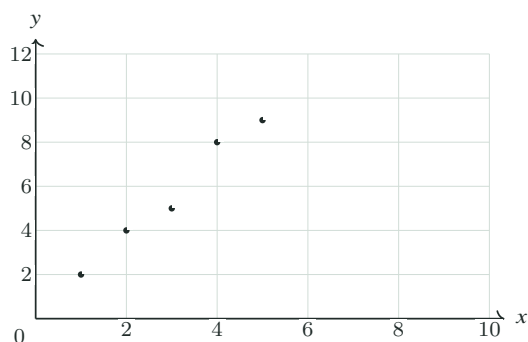
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Investigate the point

An unusual value is not automatically an error.

Q16

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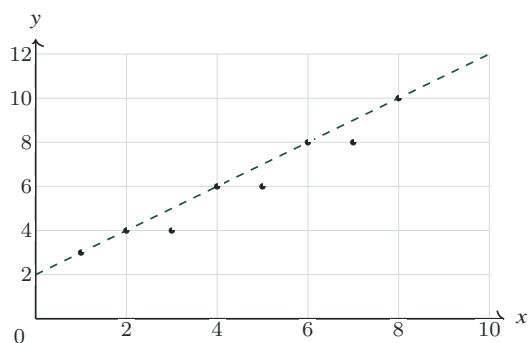
 $(1, 2), (2, 4), (3, 5), (4, 8), (5, 9)$ Plot x horizontally and y vertically.

Q17

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 $y \approx x + 2$

Follow the overall trend through the middle of the points.



Q18

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 $y \approx 5 + 2 = 7$ Read up to the line and across to the y -axis.

Q19

 $x = 4$

This uses the trend within the data range.

Q20

 $31 = 3x + 10$ Substitute the requested y -value. $x = (31 - 10)/3 = 7$

Rearrange the line equation.

Q21

$$600 \left(\frac{28}{80} \right) = 210$$

Apply the sample proportion to the population.

Q22

Sample A

The volunteers choose whether to take part. A larger number of volunteers does not make the sample representative.

Q23

$$A : 1000 \left(\frac{40}{50} \right) = 800$$

$$B : 3000 \left(\frac{20}{50} \right) = 1200$$

$$800 + 1200 = 2000$$

Apply the first area's sample proportion.

Use the different population size for the second area.

Add the estimated numbers, not the unweighted percentages.