

GCSE MATHS

Data, charts and averages

Worked Solutions

Q1

★

(a) Categorical

Colours label groups, not numerical amounts.

(b) Discrete

Siblings are counted in whole numbers.

(c) Continuous

Time is measured and can take values between whole seconds.

Q2

★★

(a) $2 + 5 + 4 + 1 = 12$

Add the frequencies.

(b) $0(2) + 1(5) + 2(4) + 3(1) = 16$

Multiply each number of books by its frequency and add.

(c) $4 + 1 = 5$

Five pupils read at least two books.

$$\frac{5}{12}$$

Divide by the total of 12 pupils.

Q3

★

$$8 - 2 = 6$$

Read both bar heights and subtract.

Q4

★★

$$120 \left(\frac{72}{360} \right) = 24$$

Use the same fraction of the pupils as of the circle.

Q5

★★

$$\frac{18}{60}(360^\circ) = 108^\circ$$

Multiply the category fraction by a full turn.

Q6

★★

$$3(8) + 4 = 28$$

Half a symbol represents four people.

Q7

**

$$35 - 30 = 5$$

$$45 - 40 = 5$$

Compare decreases between consecutive months.

Q8

**

14, 17, 20, 23, 23, 28

$$\text{Median} = (20 + 23)/2 = 21.5$$

Read the ordered values.

Average the two middle values.

Q9

*

$$(4 + 7 + 8 + 9 + 12)/5 = 8$$

Divide the total by five.

Q10

**

3, 5, 7, 9, 11, 13

$$(7 + 9)/2 = 8$$

Put the values in order.

Average the middle pair.

Q11

*

5

Five occurs most often.

Q12

*

$$7 - (-4) = 11$$

Subtract the lowest from the highest.

Q13

**

Median

The extreme salary affects the mean much more.

Q14

$$62 > 58$$

Class A has a higher typical score by the median.

$$10 < 18$$

B has less spread by the range.

Q15

$$\text{Total} = 5(12) = 60$$

Recover the total from the mean.

$$x = 60 - (8 + 10 + 13 + 14) = 15$$

Subtract the known values.

Q16

$$\text{New total} = 8(15) + 18 + 22 = 160$$

Add the new scores to the old total.

$$\text{New mean} = 160/10 = 16$$

There are now ten pupils.

Q17

$$\text{Total} = 12(150) + 8(160) = 3080$$

Weight each mean by its group size.

$$3080/20 = 154 \text{ cm}$$

Divide by the combined group size.

Q18

$$5(3) + 15(5) + 25(2) = 140$$

Multiply each midpoint by its frequency.

$$140/10 = 14 \text{ minutes}$$

Divide by the total frequency.

Q19

(a) $3(8) + 5 = 29$

Apply both operations to the mean.

(b) $3(6) = 18$

Adding five shifts all values equally and does not change the range.

Q20

★★★★

$$\frac{11 + 2x}{5 + x} = 2.125$$

$$11 + 2x = 10.625 + 2.125x$$

$$0.375 = 0.125x \Rightarrow x = 3$$

Write total divided by frequency.

Multiply out.

Solve for the frequency.