

A02 Example – Statistics

This Grade C question challenges you to use statistics in a real-life context – working with the data to solve a problem.

The frequency table shows the times that some motorists were stuck in traffic jams (to the nearest 10 minutes). One of the frequencies is missing (shown by n in the table).

The mean waiting time is 28 minutes.

- How many motorists are in this survey?
- What is the total number of minutes of waiting time for those motorists whose data can be seen in the table?
- Write an expression for the total number of minutes of waiting time for those motorists who waited 20 minutes?
- Write an expression for the mean waiting time and use it to calculate the missing frequency.

Number of minutes (to the nearest 10)	Frequency
10	4
20	n
30	12
40	5
50	2

What maths should you use?

a Total number of motorists = $4 + n + 12 + 5 + 2 = 23 + n$

Sum the frequencies.

b Total = $(4 \times 10) + (12 \times 30) + (5 \times 40) + (2 \times 50) = 700$

Don't forget to multiply the times by the frequencies.

c Total = $20n$

d $\frac{700 + 20n}{23 + n} = 28$

$$700 + 20n = 28(23 + n)$$

$$= 644 + 28n$$

$$700 - 644 = 28n - 20n$$

$$56 = 8n$$

$$n = 7 \text{ so the missing frequency is 7.}$$

- Set up an equation using the formula for the mean waiting time:

$$\frac{\text{total number of minutes waiting time}}{\text{total number of motorists}}$$
- Solve the equation

A03 Question – Statistics

Now try this A03 Grade C question. You have to work it out from scratch. READ THE QUESTION CAREFULLY.

It's similar to the A02 example above, so think about where to start.

The frequency table shows the journey time to school by some students (to the nearest 5 minutes).

One of the frequencies is missing (shown by n in the table).

The mean journey time is 19 minutes.

Calculate the missing frequency.

You **must** show your working.

Number of minutes (to the nearest 5)	Frequency
10	12
15	3
20	11
25	n
30	5

Work out the total time by multiplying the times by the frequencies.

Use the formula for the mean journey time to set up an equation and then solve it.



Missed appointments

At a dental surgery, patients make an appointment to see either a dentist or a hygienist or both. If the patient misses their appointment they are fined according to the length of the appointment they missed. They are fined at the rate of £60 per hour.

Question bank

- 1 How long is a dentist appointment?
- 2 In 2009, in which month were the most dentist appointments missed?
- 3 How much is a patient fined for missing a hygienist appointment?

At the end of 2009, the practice manager writes a report on the number of appointments that patients missed. The practice manager writes, 'Altogether the total money due from fines comes to £28 620.'

- 4 Is the practice manager's total correct? Show working to justify your answer.
- 5 Calculate the mean, median and modal monthly number of dentist appointments missed in 2009.

In his report, the practice manager also writes, 'On average, more dentist appointments were missed per month than hygienist appointments.'

- 6 Is the practice manager correct? Explain clearly the reasons for making your decision. You could use some of your previous working to help you.

Information bank

Surgery facts

The surgery opens from 9 am to 6 pm Monday to Friday.

The surgery closes for lunch from 1 pm to 2 pm.

There are six dentists at the surgery.

A dentist appointment lasts 15 minutes.

There are three hygienists at the surgery.

A hygienist appointment lasts 10 minutes.

The total number of hygienist appointments missed in 2009 is 1008.

The median monthly number of hygienist appointments missed in 2009 is 81.

The modal monthly number of hygienist appointments missed in 2009 is 96.

There are two receptionists at the surgery.

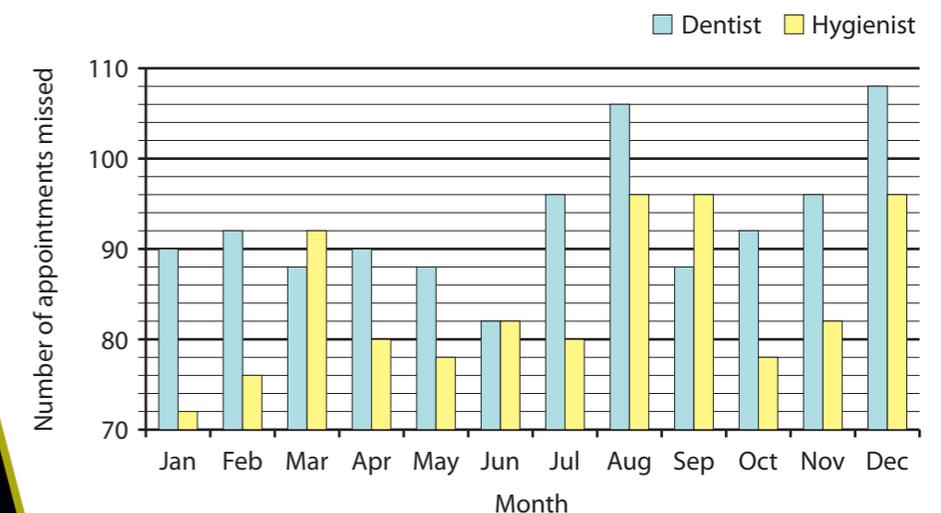
Salary facts

A dentist at the surgery earns £86 000 per year.

A hygienist at the surgery earns £26 000 per year.

A receptionist at the surgery earns £15 000 per year.

Number of dentist and hygienist appointments missed in 2009



C

A02 Example – Number

This Grade C question challenges you to use number in a real-life context – applying maths you know to solve a problem.

Peter supports a football team playing in the Champions League. He wants to go to watch a match for which tickets cost £45. He can only afford to pay £27.

a What percentage of the ticket price can Peter afford?

Peter plays football for a local junior team and his Dad says he will give him 5% of the ticket price for every 2 goals Peter scores for his local team. So far Peter has scored 9 goals.

b How many more goals must he score so that he is able to buy the ticket?

What maths should you use?

You need a formula to work out percentages.

a Percentage Peter can afford = $\frac{27}{45} \times 100\% = 60\%$

b Percentage of ticket price needed = 40%

5% of ticket price = 2 goals

So 40% of ticket price = $8 \times 5\% = 16$ goals

16 goals are needed altogether.

Peter has already scored 9 so he needs to score another 7 goals.

$\frac{\text{amount he can afford}}{\text{total ticket price}} \times 100\%$

Work out how many lots of 5% are still needed.

C

A03 Question – Number

Now try this A03 Grade C question. You have to work it out from scratch. READ THE QUESTION CAREFULLY.

It's similar to the A02 example above, so think about where to start.

Jane wants to go to a live performance of a TV talent show at the end of term.

The price of the ticket is £75.

She has saved £54 towards the cost of the ticket.

Jane's Mum says she will help her and promises her 4% of the ticket price for every 5 merits Jane earns at school.

Jane has earned 19 merits so far this term.

What percentage of the ticket cost still needs to be found?

A03 How many more merits must Jane earn so that she will have enough money for the TV talent show ticket?