A QUESTION A DAY Keeps your TEACHER AT BAY

Written and Collated by Mr. Slack
This booklet has been written for you, a GCSE student, who is getting close to your GCSE maths exams. There are 20 days worth of GCSE questions, aimed at the challenging C grade areas that students so often get wrong because they don’t read it properly or just get the maths wrong.

Each day, you will answer a question and your teacher will check it for you. You then make any corrections you need to make, helping your revision and keeping your teacher off your back! Everybody wins!

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Space For Notes...
Here is part of a railway timetable.

<table>
<thead>
<tr>
<th>Location</th>
<th>10:13</th>
<th>10:30</th>
<th>10:33</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Street</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marston Green</td>
<td>10:26</td>
<td>↓</td>
<td>10:41</td>
</tr>
<tr>
<td>Birmingham International</td>
<td>10:29</td>
<td>10:39</td>
<td>10:45</td>
</tr>
<tr>
<td>Hampton-in-Arden</td>
<td>10:32</td>
<td>↓</td>
<td>10:48</td>
</tr>
<tr>
<td>Tile Hill</td>
<td>10:40</td>
<td>↓</td>
<td>10:55</td>
</tr>
<tr>
<td>Coventry</td>
<td>10:47</td>
<td>10:49</td>
<td>11:00</td>
</tr>
</tbody>
</table>

(a) Work out how long the 10 13 train takes to go from New Street to Coventry.

The 10 13 train arrives to Coventry at _______________

____ - 13 = _______ minutes

............................ minutes

(1)

Harry is at Birmingham International. He needs to be at Tile Hill by 11 00.

(b) What time is the latest train from Birmingham International he can catch?

The latest he can arrive at Tile Hill is 10:55.

This means he must leave Birmingham International at...

..............................

(1)

(The total for this question is 2 marks)
Here is part of a train timetable from Birmingham to Leicester.

<table>
<thead>
<tr>
<th>Location</th>
<th>06 23</th>
<th>06 53</th>
<th>07 23</th>
<th>07 53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birmingham</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coleshill</td>
<td>06 35</td>
<td>07 05</td>
<td>07 35</td>
<td>08 05</td>
</tr>
<tr>
<td>Nuneaton</td>
<td>07 00</td>
<td>07 22</td>
<td>07 51</td>
<td>08 22</td>
</tr>
<tr>
<td>Hinckley</td>
<td>00 00</td>
<td>07 29</td>
<td>07 58</td>
<td>08 29</td>
</tr>
<tr>
<td>Leicester</td>
<td>07 17</td>
<td>07 48</td>
<td>08 17</td>
<td>08 48</td>
</tr>
</tbody>
</table>

A train leaves Birmingham at 06 53

(a) (i) What time should this train get to Hinckley?

..........................................................................................................

(ii) How many minutes should this train take to get to Hinckley?

............................................................................................................. minutes

(2)

Silvia wants to catch a train in Nuneaton. She needs to get to Leicester before 08 30

(b) Write down the time of the latest train Silvia can catch from Nuneaton.

..........................................................................................................

(1)

A train will leave Leicester at 07 27 for Stansted Airport. The train should take 2 hours 28 minutes to go from Leicester to Stansted Airport.

(c) What time should the train get to Stansted Airport?

..........................................................................................................

(1)

(The total for this question is 4 marks)
The diagram shows a rectangle and a square.

The perimeter of the rectangle is the same as the perimeter of the square.

Work out the length of one side of the square.

The perimeter of the rectangle is \( __ + __ + __ + __ = __ \)

So the perimeter of the square is...

So the length of one side is...

.............................................. cm

(The total for this question is 4 marks)
A circle has a radius of 6 cm.

A square has a side of length 12 cm.

Work out the difference between the area of the circle and the area of the square.

Give your answer correct to one decimal place.

\[ ... \text{ cm}^2 \]

(The total for this question is 4 marks)
Work out the difference in value between $\frac{1}{4}$ and 30%.

$\frac{1}{4}$ can be written as ___%.

This difference between ___% and 30% is...

As a decimal, the difference could be...

..........................................

(Total for Question 9 is 2 marks)
Debbie, Salma and Wendy did a Maths test. The total for the test was 40 marks.

Debbie got 16 out of 40
Salma got 35% of the 40 marks.
Wendy got \(\frac{3}{8}\) of the 40 marks.

Who got the highest mark? You must show all your working.

(The total for this question is 4 marks)
Potatoes cost £9 for a 12.5 kg bag at a farm shop. The same type of potatoes cost £1.83 for a 2.5 kg bag at a supermarket.

Where are the potatoes the better value, at the farm shop or at the supermarket? You must show your working.

Farm Shop

\[
\frac{£9}{12.5 kg} = \frac{£1}{?} \quad \text{Divide both by.}
\]

Supermarket

\[
\frac{£1.83}{2.5 kg} = \frac{£1}{?} \quad \text{Divide both by.}
\]

At the farm shop, I would get ________ kg (2 decimal places) of potatoes for £1. At the supermarket I would get ________ kg (2 decimal places) of potatoes for £1.

Therefore the ________ is better value for money.

(The total for this question is 4 marks)
A pack of 9 toilet rolls costs £4.23
A pack of 4 toilet rolls costs £1.96

Which pack gives the better value for money?

You must show all your working.

(Total for this question is 3 marks)
Buses to Acton leave a bus station every 24 minutes. Buses to Barton leave the same bus station every 20 minutes.

A bus to Acton and a bus to Barton both leave the bus station at 9:00 am.

When will a bus to Acton and a bus to Barton next leave the bus station at the same time?

The Lowest Common Multiple (LCM) of 24 and 20 is _____

So both buses will leave at the same time _________ minutes after 9:00 am.

So both buses will leave together again at ________

(The total for this question is 3 marks)
Trams leave Piccadilly

- to Eccles every 9 minutes
- to Didsbury every 12 minutes

A tram to Eccles and a tram to Didsbury both leave Piccadilly at 9 a.m.

At what time will a tram to Eccles and a tram to Didsbury next leave Piccadilly at the same time?

.......................................................

(The total for this question is 3 marks)
The diagram shows a garden in the shape of a rectangle. All measurements are in metres. The perimeter of the garden is 32 metres. Work out the value of $x$.

The total perimeter of the rectangle is

$$4 + 3x + x + 6 + \underline{\hphantom{0}} + \underline{\hphantom{0}} = 32$$

$$\underline{\hphantom{0}} = 32$$

$$8x = \underline{\hphantom{0}}$$

$$x = \underline{\hphantom{0}}$$

(The total for this question is 4 marks)
The diagram shows a parallelogram. The sizes of the angles, in degrees, are

\[
\begin{align*}
2x \\
3x - 15 \\
2x \\
2x + 24
\end{align*}
\]

Work out the value of \(x\).

\[x = \text{..............................................}\]

(The total for this question is 3 marks)
The pie chart shows some information about the time Gill spent working in her garden one month.

(a) What fraction of the time did Gill spend cutting the grass?

There are _____° in total in the pie chart.

_____° of the pie chart is for “cutting the grass”

So the simplified fraction is...

.............................................

(1)

Gill spent 7 hours weeding.

(b) How much time did Gill spend planting?

Weeding is _______° – 40 – 80 – 100 = ______°

So ______° = 7 hours

_____° = 1 hour

Divide by...

So planting is...

............................................. hours

(3)

(The total for this question is 4 marks)
The pie charts show some information about the numbers of medals won by Germany and by the Russian Federation in the 2010 Winter Olympics.

Germany won 7 bronze medals.

(a) How many gold medals did Germany win?

..............................................
(2)

(b) Graham says,

‘The pie charts show that Germany won more gold medals than the Russian Federation’.

Is Graham right? ......................

You must explain your answer.
................................................................................................
................................................................................................
................................................................................................
(1)

(The total for this question is 3 marks)
Mr Mason asks 240 Year 11 students what they want to do next year.

15% of the students want to go to college.

$\frac{3}{4}$ of the students want to stay at school.

The rest of the students do not know.

Work out the number of students who do not know.

Finding 15% of 240 students:

$1\%$ of 240 = $240 \div \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

15% of 240 = $\underline{\hspace{1cm}} \times 15 = \underline{\hspace{1cm}}$

Finding $\frac{3}{4}$ of 240 students:

$\frac{1}{4}$ of 240 = $240 \div \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

$\frac{3}{4}$ of 240 = $\underline{\hspace{1cm}} \times 3 = \underline{\hspace{1cm}}$

The number of students left over is...
Rani has 250 DVDs.

42% of her DVDs are thrillers.

\( \frac{2}{5} \) of her DVDs are comedies.

The rest of her DVDs are science fiction.

How many science fiction DVDs does Rani have?

..............................................

(The total for this question is 4 marks)
Day 9

Linda is going on holiday to the Czech Republic. She needs to change some money into koruna. She can only change her money into 100 koruna notes. Linda only wants to change up to £200 into koruna. She wants as many 100 koruna notes as possible. The exchange rate is £1 = 25.82 koruna.

(a) How many 100 koruna notes should she get?

\[ \begin{align*}
  \text{£}1 &= 25.82 \text{ koruna} \\
  \text{£200} &= \_ \text{ koruna} \\
  \_ \text{ koruna} &\div 100 \text{ koruna} = \_ \text{ notes}
\end{align*} \]

..............................................

(3)

Linda buys a meal in the Czech Republic. The meal costs 400 koruna.

(b) Work out the cost of the meal in pounds.

\[ \begin{align*}
  \text{£1} &= 25.82 \text{ koruna} \\
  \_ \text{ koruna} &= 1 \text{ koruna} \\
  \_ \text{ koruna} &\times 400 \text{ koruna} = \_ \text{ notes}
\end{align*} \]

..............................................

(3)

(The total for this question is 6 marks)
Robert and his family are going on holiday to France.

A bank gives Robert this chart to help him change between pounds (£) and euros (€).

<table>
<thead>
<tr>
<th>pounds (£)</th>
<th>euros (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>5</td>
<td>6.0</td>
</tr>
<tr>
<td>10</td>
<td>12.0</td>
</tr>
<tr>
<td>20</td>
<td>24.0</td>
</tr>
<tr>
<td>50</td>
<td>60.0</td>
</tr>
<tr>
<td>100</td>
<td>120.0</td>
</tr>
</tbody>
</table>

Robert changes £600 into euros (€).

(a) How many euros should Robert get?

€ ..............................................

(2)

In France, a laptop costs €540.
In England, the same laptop costs £460.

(b) Work out the difference between the cost of the laptop in France and the cost of the laptop in England. You must show clearly how you got your answer.

......................................

......................................

(3)

(The total for this question is 5 marks)
ABC is a straight line.

BD = CD.

Angle BDC = 50°.

Angle ADB = 20°.

Work out the size of the angle marked x.
Give reasons for your answer.

Triangle BCD is _______________

Therefore angle _____ = angle _____

_____° - 50° = ______°

So angle B = ______°

Angles on a ____________ ________ sum to 180°

So the angle next to B is _____°

Then using angles in a triangle...

(The total for this question is 4 marks)
ABCD is a parallelogram.

Angle $ADB = 38^\circ$.
Angle $BEC = 41^\circ$.
Angle $DAB = 120^\circ$.

Calculate the size of angle $x$.
You must give reasons for your answer.

(The total for this question is 4 marks)
You can use this conversion graph to change between pounds (£) and dollars ($).

(a) Use the conversion graph to change £5 to dollars.

$ ....................................

(1)

Ella has $200 and £800
Her hotel bill is $600

Ella pays the bill with the $200 and some of the pounds.

(b) Use the conversion graph to work out how many pounds she has left.

After paying 200 dollars, she has ______ left to pay.

We know £5 = $_______ and so £_______ = $400

£800 - £_______ = £_______

£ ....................................

(4)

(The total for this question is 5 marks)
You can use this graph to change between pounds (£) and dollars ($).

(a) Change £20 into dollars ($).

$.................................

(1)

In London, Sano headphones cost £60
In New York, Sano headphones cost $100

Sano headphones cost more in New York than in London.

(b) How much more?

.................................

(3)

(The total for this question is 4 marks)
The diagram shows a prism.

Work out the volume of the prism.

**Volume of a prism = area of the cross-section x length**

**Area of the cross-section:**

The area of the left hand rectangle = ____ x ____ = ____

The area of the right hand rectangle = ____ x 2cm = ____

Total area of the cross-section = ____________

Volume = ____________ x ____________ =

.................................................. cm$^3$

(The total for this question is 3 marks)
Here is a solid prism.

Work out the volume of the prism.

.......................................... \text{cm}^3

(The total for this question is 3 marks)
Colin, Dave and Emma share some money.
Colin gets $\frac{3}{10}$ of the money.
Emma and Dave share the rest of the money in the ratio 3 : 2.

What is Dave’s share of the money?

Emma and Dave share in the ratio 3:2.

$$3 + 2 = \_\_\_\_$$

So Dave will have $\frac{?}{5}$

Colin gets $\frac{3}{10}$ which will leave $\frac{?}{10}$

$$\frac{?}{5} \times \frac{?}{10}$$

$\_\_\_\_ = \_\_\_\_$

(The total for this question is 4 marks)
Talil is going to make some concrete mix. He needs to mix cement, sand and gravel in the ratio 1 : 3 : 5 by weight.

Talil wants to make 180 kg of concrete mix.

Talil has

- 15 kg of cement
- 85 kg of sand
- 100 kg of gravel

Does Talil have enough cement, sand and gravel to make the concrete mix?

(The total for this question is 4 marks)
Ashley wants to buy some tins of paint. He finds out the costs of paint at two shops.

Ashley needs 9 tins of paint. Ashley wants to get all the tins of paint from the same shop. He wants to pay the cheapest possible total price.

Which of the two shops should Ashley buy the paint from?

Paint R Us: Only need to pay for ________ tins

\[ 2.19 \times _____ = £_______ \]

Deco Mart: Need to buy ________ tins

\[ 1.80 \times _____ = £_______ \]

10% of Deco Mart total = ________

Take off this 10% ...

So the best value is...

(The total for this question is 6 marks)
The same type of computer is sold in two shops.

<table>
<thead>
<tr>
<th>Computer World</th>
<th>Logic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta computer</td>
<td>Beta computer</td>
</tr>
<tr>
<td>Normal price : £359</td>
<td>Pay £110 now and pay 12 instalments of £16.80 per month</td>
</tr>
<tr>
<td>15% off normal price</td>
<td></td>
</tr>
</tbody>
</table>

What is the difference in the cost of a Beta computer in Computer World and the cost of a Beta computer in Logic?

You must show all your working.

£.................................

(Total for Question 25 is 5 marks)
(a) Work out the value of $2f + 7$

\[
2(8) + 7 = \underline{ \hspace{2cm} } + 7 = \underline{ \hspace{2cm} }
\]

(b) Work out the value of $T$.

\[
T = 3g + 5h
\]

\[
g = -2 \quad h = 4
\]

\[
T = 3(-2) + 5(4) = \underline{ \hspace{2cm} } + \underline{ \hspace{2cm} } = \underline{ \hspace{2cm} }
\]

(The total for this question is 4 marks)
\[ y = 4x + c \]
\[ x = 7.5 \]
\[ c = 5.4 \]

(a) Work out the value of \( y \).

(b) Work out the value of \( x \).

\( y = 4 \times + c \)
\[ y = 18.8 \]
\[ c = -2.4 \]

(The total for this question is 4 marks)
Here is a fair 6-sided spinner.

![Image of a 6-sided spinner]

Jake is going to spin the spinner once.

(a) Write down the probability that the spinner will land

(i) on 4

..............................................

(ii) on a number greater than 10

..............................................

(2)

Liz is going to spin the spinner 120 times.

(b) Work out an estimate for the number of times the spinner will land on 7.

The probability of landing on a 7 = \( \frac{?}{6} \)

\( \frac{?}{6} \) of 120 = _______

..............................................

(2)

(The total for this question is 4 marks)
Hannah has a biased coin.
She is going to throw the coin once.
The probability of getting heads is 0.7

(a) Work out the probability of getting tails.

..............................................

(2)

Jamal is going to throw this coin 200 times.

(b) Work out an estimate for the number of heads Jamal will get.

..............................................

(2)

(The total for this question is 4 marks)
Translate the triangle by \[ \left( \begin{array}{c} -3 \\ 2 \end{array} \right) \]

\[ \left( \begin{array}{c} -3 \\ 2 \end{array} \right) \] means 3 to the ____ and 2 ____

(The total for this question is 2 marks)
Translate shape P by the vector \( \begin{pmatrix} 5 \\ -2 \end{pmatrix} \).
(a) Write 8 45 p.m. as a 24-hour clock time.

..........................................

(1)

Seeta did a puzzle in 3 minutes 45 seconds.
Ninal did the same puzzle in 7 minutes 28 seconds.

Seeta says,

‘I did the puzzle in less than half the time Ninal did the puzzle.’

*(b) Is Seeta right?
You must show all your working.

3 minutes and 45 seconds = ___________ seconds

7 minutes and 28 seconds = ___________ seconds

This shows that ________ was fastest and Seeta was ___.

(The total for this question is 4 marks)
A film starts at 17:50.
The film ends at 19:30.

(a) How long does the film last?

Jackie buys some tickets to see the film.
Each ticket costs £4.50.
Jackie pays with two £20 notes.
Jackie gets £8.50 change.

(b) How many tickets did Jackie buy?
On the grid, draw the graph of $y = \frac{1}{2}x + 5$ for values of $x$ from $-2$ to $4$. 

<table>
<thead>
<tr>
<th>$x$</th>
<th>$-2$</th>
<th>$-1$</th>
<th>$0$</th>
<th>$1$</th>
<th>$2$</th>
<th>$3$</th>
<th>$4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>$4$</td>
<td></td>
<td>$5$</td>
<td>$5.5$</td>
<td></td>
<td></td>
<td>$7$</td>
</tr>
</tbody>
</table>

(The total for this question is 3 marks)
On the grid, draw the graph of \( y = 3x + 2 \) for values of \( x \) from -2 to 2.

(The total for this question is 4 marks)
Each Saturday, Sarah cycles from her house to the gym.

The travel graph shows Sarah’s journey to the gym.

(a) What time does she leave home?

.......................... (1)

(b) How far is the gym from Sarah’s house?

.......................... km (1)

Sarah stays at the gym for $1\frac{1}{2}$ hours.

She then cycles back to her house at 18 km/h.

(c) Complete the travel graph.

Sarah stayed at the gym until _________

At 18 km/h it will take her ____ to travel 12 km.

(The total for this question is 8 marks)
On Monday, Holly walked from her home to school. She stopped at her friend’s house on the way to school.

On Tuesday, Holly cycled from her home to school.

The travel graphs show Holly’s journey on Monday and on Tuesday.

### Monday

- **Distance from home (km):**
  - 0
  - 1
  - 2
  - 3

- **Time taken (minutes):**
  - 0
  - 5
  - 10
  - 15
  - 20
  - 25
  - 30

### Tuesday

- **Distance from home (km):**
  - 0
  - 1
  - 2
  - 3

- **Time taken (minutes):**
  - 0
  - 5
  - 10
  - 15
  - 20
  - 25
  - 30
(a) Write down the distance from Holly’s home to school.

........................................................................ km

(1)

(b) Write down how long Holly stopped at her friend’s house on Monday.

........................................................................ minutes

(1)

Holly took less time to get to school on Tuesday than on Monday.

(c) How many minutes less?

........................................................................ minutes

(2)

(The total for this question is 4 marks)