

KS3 MATHEMATICS

10 4 10

Level 4 Answers

Day 1

Mental Arithmetic Questions

1. The tally chart shows the number of questions a teacher asked in a lesson. How many questions did the teacher ask?



2. How many seconds are there in two minutes?

$$60 \times 2 = 120 \text{ seconds}$$

3. What number is the arrow pointing to on the number line?



4. The time is now one p.m. My train is due at sixteen hundred hours. How many hours is it before my train is due?

1 pm is 1300 hours

So $1600 - 1300$ gives **3 hours**

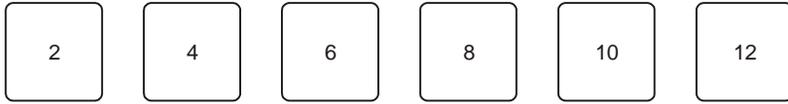
5. What is the next number in this halving sequence?

Twenty, ten, five, ...

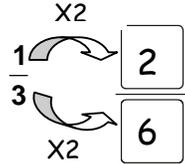
Half of 5 is **2.5**

Cards for fractions

Here are six number cards.



- (a) Choose two of these six cards to make a fraction that is equivalent to $\frac{1}{3}$.



OR $\frac{4}{12}$. Remember to multiply both the top and bottom numbers by the same number

1 mark

- (b) Choose two of these six cards to make a fraction that is greater than $\frac{1}{2}$ but less than 1

greater than $\frac{1}{2}$ but less than 1

$\frac{4}{6}$ OR $\frac{6}{8}$ OR $\frac{6}{10}$ OR $\frac{8}{10}$ OR $\frac{8}{12}$ OR $\frac{10}{12}$



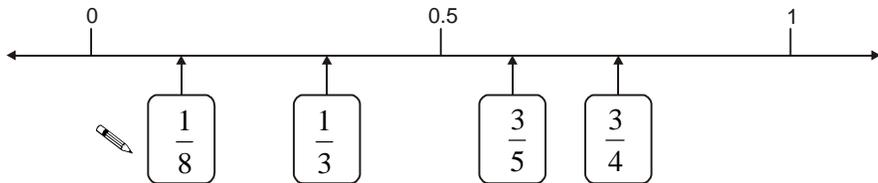
1 mark

Placing fractions

Here are four fractions.

$\frac{3}{4}$ $\frac{1}{8}$ $\frac{1}{3}$ $\frac{3}{5}$

Look at the number line below. Write each fraction in the correct box.



2 marks

Equations

Solve these equations.

$$a + 12 = 24$$

$$24 - 12 = 12$$

$$a = 12$$

1 mark

$$b - 12 = 24$$

$$b = 36$$

1 mark

$$24 + 12 = 36$$

Café

A café sells coffee and toast.

	1 cup of coffee
	1 slice of toast
Cost £1.30	

	1 cup of coffee
	2 slices of toast
Cost £1.70	

How much does **1 cup of coffee** cost?

The only difference between the two is second one has an extra piece of toast. So the toast must cost £1.70 - £1.30 = 40p.

So the coffee must cost £1.30 - 40p, which gives 90p.

$$90 \text{ p}$$

1 mark

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Level 4 Answers

Day 2

Remember to put the lengths of the missing sides!

Mental Arithmetic Questions

1. A teacher asked some pupils if they had a part-time job. The pie chart shows the results. The teacher asked twenty pupils. How many of them said yes?

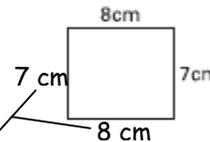
Yes is a quarter of the pie, so the teacher asked a quarter of 20.
 $20 \div 4 = 5$, so **5 students**



2. Four packets of biscuits cost one pound. How much would six packets of biscuits cost?

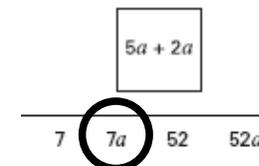
$\pounds 1 \div 4 = 25\text{p}$, so each biscuits costs 25p.
 $6 \times 25\text{p} = 150\text{p}$ or $\pounds 1.50$.

3. Look at the rectangle. What is its perimeter?



Perimeter is the distance around a shape, so $8\text{cm} + 7\text{cm} + 8\text{cm} + 7\text{cm}$.
This gives **30 cm**.

4. Look at the expression in the square. Which answer below is the same as the expression in the square? Ring the correct one.



5. Look at the equation. When x equals five, what is the value of y ?

$$y = 3x + 6$$

$y = 3 \times 5 + 6$
 $y = 15 + 6$
 $y = 21$

Weighing a dog

Jack weighs himself.



Then Jack weighs himself together with his dog.



How much does the dog weigh?

$$60.4 - 44.8 = 15.6$$

15.6
1 mark

Decimals

This pair of decimal numbers **add to 1**

0.3

0.7

(a) Write a **different pair** of decimal numbers that add to 1

Lots of different answers:
0.2 and 0.8 **OR** 0.1 and 0.9
OR 0.4 and 0.6 **OR** 0.5 and 0.5
Can be any order.

1 mark

(b) The pair of decimal numbers below should add to 1
Write the missing decimal number.

0.85

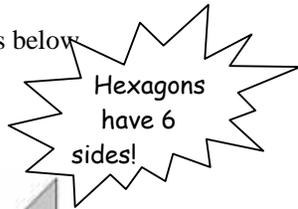
0.15

1 mark

Hexagons

I use two congruent trapeziums to make the shapes below.

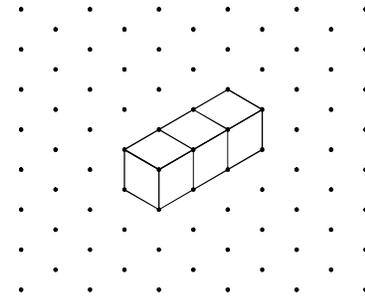
Tick (✓) all the shapes that are **hexagons**.



2 marks

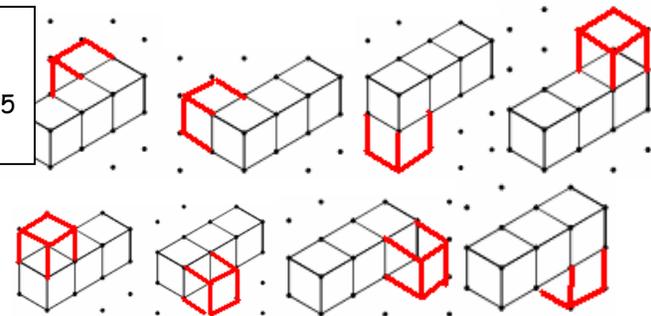
Four cubes

I join **three cubes** in a line to make this shape.



Then I join **one more cube** to make an **L-shape**.

Draw the L-shape on the paper below.



2 marks

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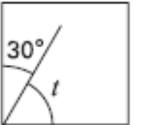
Level 4 Answers

Day 3

Mental Arithmetic Questions

1. The diagram shows a line inside a square. What is the size of the angle labelled i ?

Angles inside a square are 90° , so
 $90 - 30 = 60$
 60°



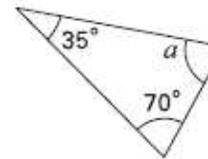
2. In my family, the range of heights is 25 cm. The height of the shortest person is 125 cm. What is the height of the tallest person?

Range means the difference between the largest and the smallest, so something take away 25 cm gives 125 cm.
 $125 + 25 = 150$, so **150 cm**.

3. Multiply 4.7 by 100.

4×100 gives 400, so
 $4.7 \times 100 = \mathbf{470}$

4. Look at the triangle. Work out the size of angle a .



The sum of the angles in a triangle is 180° , so first add the two angles.
 $35^\circ + 70^\circ = 105^\circ$.
Then $180^\circ - 105^\circ = \mathbf{75^\circ}$

5. What is the next prime number after nineteen?

Remember: Prime numbers have exactly 2 factors (1 and the number itself).
Answer: **23**

Caribbean cordial

Here are the ingredients for a cordial used to make a drink.

- 50g ginger
- 1 lemon
- 1.5 litres of water
- 900g sugar

25 is half of 50 (which is the amount in the original recipe), so half the amounts of everything!

- (a) Jenny is going to make this cordial with **25g** of ginger. How much lemon, water and sugar should she use?

OR $\frac{3}{4}$

25g ginger

$\frac{1}{2}$ lemon

..... 0.75 litres of water

..... 450g sugar

3 marks

- (b) The finished drink should be $\frac{1}{3}$ cordial and $\frac{2}{3}$ water.

Jenny puts **100 ml** of cordial in a glass. How much water should she put with it?

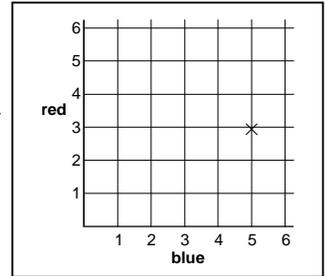
If **one** third is 100 ml, then **two** thirds must be twice this!

..... 200 ml

1 mark

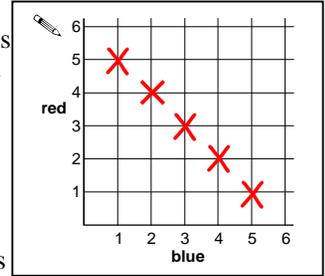
Throwing dice

Some pupils throw two fair six-sided dice. Each dice is numbered 1 to 6. One dice is blue. The other dice is red. Anna's dice show **blue 5, red 3**. Her **total score** is **8**. The cross on the grid shows her throw.



- (a) Carl's **total score** is **6**. What numbers could Carl's dice show? Put crosses on the grid to show **all** the different pairs of numbers Carl's dice could show.

2 marks

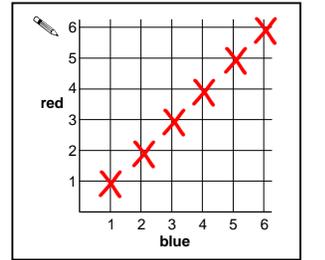


- (b) The pupils play a game.

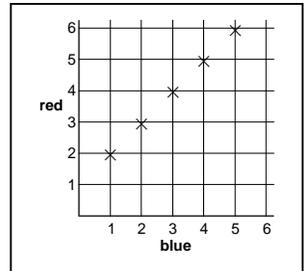
Winning rule:	Win a point if the number on the blue dice is the same as the number on the red dice.
---------------	--

Put crosses on the grid to show **all** the different winning throws.

2 marks



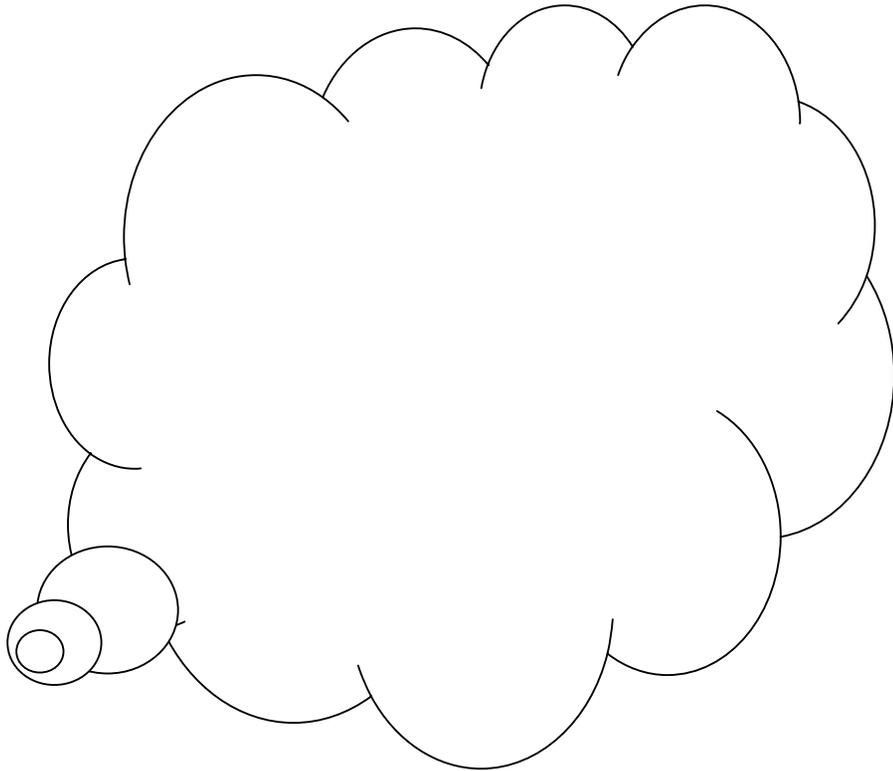
- (c) The pupils play a different game. The grid shows all the different winning throws.



Complete the sentence below to show the winning rule.

Winning rule:	Win a point if the number on the blue dice is One more than the number on the red dice
---------------	---

1 mark



Mental Arithmetic Questions

1. What is 20% of £300?

To find 10%, divide by 10, so 10% is $300 \div 10$, which is 30. 20% is double this, so 30×2 gives **60**.

2. It takes 3 hours to travel from my home to my friend's house. I arrive at 2:00 pm. At what time did I leave home? Write your answer using am or pm.

3 hours before 2:00 pm is **11:00 am**

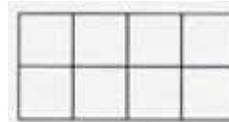
3. I count back in nought point ones. Write the next two numbers in the pattern below.

5.3, 5.2, 5.1, 4.9, 4.7

4. Subtract 9 pence from £10.

9 pence is £0.09, so
 $10.00 - 0.09$ gives **£9.91**

5. Shade one quarter of the diagram below.



There are 8 little squares,
and a quarter of 8 gives 2.
So shade any **2 little**

Write a number

(a) Write a number that is **both**

greater than 10

and

a multiple of 4

12 or 16 or 20 or ...

1 mark

(b) Now write a number that is **both**

greater than 10

and

a square number

A square number is a number multiplied by itself. 3 squared (3^2) is $3 \times 3 = 9$.

16, 25, 36, 49, ...

1 mark

Shampoo

The diagram shows what Molly buys.



?



£1.99



79p

She pays with a **£5** note and gets **66p** change.

How much did Molly pay for the shampoo?

£5 - 66p gives £4.34.
The hand cream and soap give $£1.99 + 79p = £2.78$
 $£4.34 - £2.78$ gives £1.56

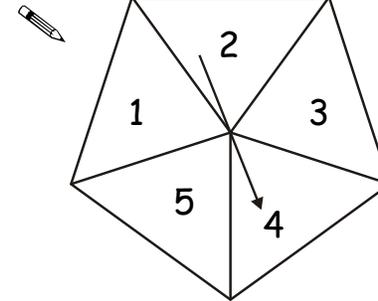
£ 1.56

2 marks

Spinners

On each spinner **write five numbers** to make the statements correct.

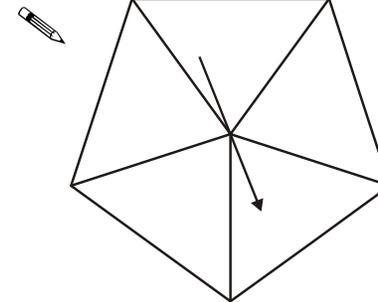
It is **certain** that you will get a number **less than 6**



This is one example. Put any numbers in each triangle, but the numbers must be less than 6.

1 mark

It is **more likely** that you will get an **even** number than an **odd** number.

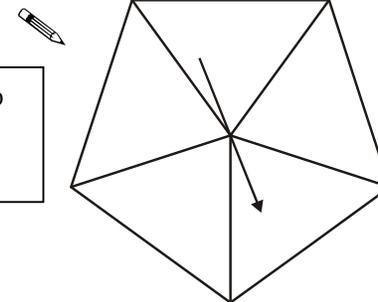


You must have at least 3 even numbers

1 mark

It is **impossible** that you will get a **multiple of 3**

Put any numbers, but do not use multiples of 3 (i.e. 3, 6, 9, 12, 15, ...)



1 mark

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Level 4 Answers

Day 5

Mental Arithmetic Questions

1. Add 72 and 38.

Try $70 + 30$ to give 100, then $2 + 8$ to give 10.
Then $100 + 10$ to give **110**.

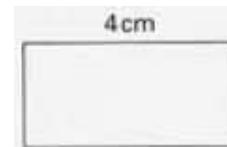
2. Centimetres are a measure of length. What are "Grams" a measure of?

Mass

3. How much is half of £9.50?

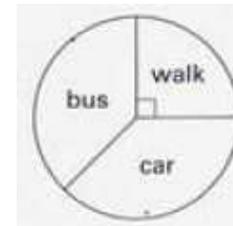
£4.75

4. The diagram shows a plan of a room. The scale is 1 centimetres to 2 metres. On the plan the room is 4 cm long. How long is the room in real life?



$4 \times 2 = 8$
8 metres

5. The pie chart shows how two hundred pupils travel to school. How many of these pupils walk to school?



Walking is a quarter of the pie, so a quarter of 200 gives **50 students**

Populations

The table shows the approximate populations of five different places.

Place	Approximate population
London	7 000 000
Sheffield	700 000
Harrogate	70 000
Ash Vale	7 000
Binbrook	700

- (a) Which of the places has a population of about **seventy thousand**?

Harrogate

1 mark

- (b) Use the table to complete these sentences.

The population of **Harrogate** is about **10 times** as big as

the population of Ash Vale.

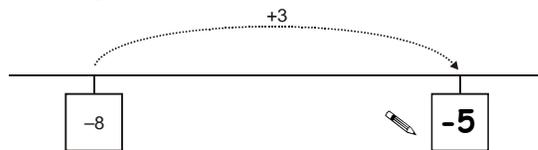
The population of London is about **100 times** as big as the population of **Harrogate**.

The population of **Sheffield** is about 100 **times** as big as the population of **Ash Vale**.

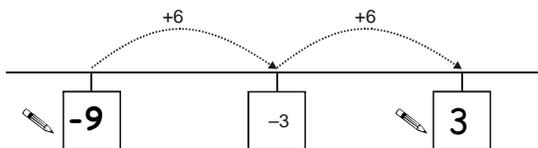
2 marks

Number lines

Write the missing numbers on the number lines.



1 mark



2 marks

Thinking of rules

- (a) I can think of three different rules to change **6** to **18**



Complete these sentences to show what these rules could be.

first rule: **add** 12

1 mark

second rule: **multiply by** 3

1 mark

third rule: **multiply by 2 then** 6

1 mark

- (b) Now I think of a new rule.

The new rule changes 10 to 5 **and** it changes 8 to 4



Write what the new rule could be.

 Divide by 2

1 mark

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Level 4 Answers

Day 6

Mental Arithmetic Questions

1. The population of the United Kingdom is about fifty-nine million. Write this number in figures.

59 000 000

2. A pupil measures his height as six feet. About how many metres is that? Ring the best answer below.

0.6 1 1.4 **1.8** 2.2

3. Write a multiple of 3 that is bigger than 100.

102 or 105 or 108 or 111 or ...

4. Look at the angle. Estimate its size in degrees.



Actual is 135°
Accept $125^\circ - 145^\circ$

5. Look at the expression. Write it as simply as possible.

$3a + 4a + 2a$

$9a$

Which calculation?

Here is some information about a school.

There are **3 classes** in **year 8**. Each class has **27 pupils**.

There are **4 classes** in **year 9**. Each class has **25 pupils**.

(a) Use the information to match each question with the correct calculation. The first one is done for you.

Question	Calculation
How many classes are there altogether in years 8 and 9?	$3 + 4$
There are more classes in year 9 than in year 8. How many more?	$3 - 4$
How many pupils are there altogether in years 8 and 9?	$4 - 3$
There are more classes in year 9 than in year 8. How many more?	$(3 \times 27) + (4 \times 25)$
How many pupils are there altogether in years 8 and 9?	$(3 + 27) + (4 + 25)$
There are more classes in year 9 than in year 8. How many more?	$(3 \times 27) - (4 \times 25)$
There are more pupils in year 9 than in year 8. How many more?	$(4 + 25) - (3 + 27)$
There are more pupils in year 9 than in year 8. How many more?	$(4 \times 25) - (3 \times 27)$

3 marks

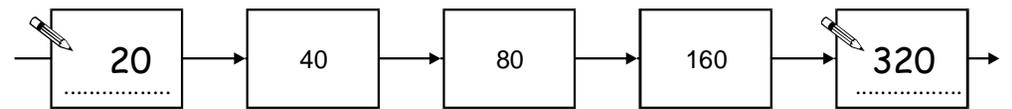
(b) Use the information about the school to write what the missing question could be.

Question	Calculation
<p>How many students are there in Year 9?</p>	4×25

1 mark

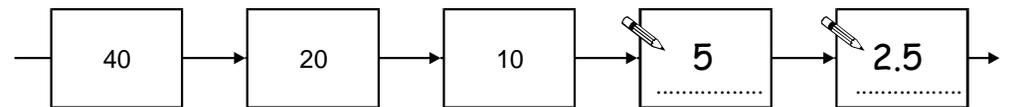
Chains

(a) The number chain below is part of a **doubling** number chain. Fill in the two missing numbers.



1 mark

(b) The number chain below is part of a **halving** number chain. Fill in the two missing numbers.



1 mark

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Level 4 Answers

Day 7

Mental Arithmetic Questions

1. In a local swimming pool, 32 lengths is half a mile. How many lengths is one mile?

$$32 \times 2 = 64 \text{ lengths}$$

2. I bought three tickets for a concert. The total cost was £45. How much was one ticket?

$$45 \div 3 = \text{£}15$$

3. Below is part of a train timetable. How long does the journey take from Twyford to Maidenhead?

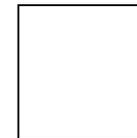
Reading	10:45
Twyford	10:54
M Maidenhead	11:02
Slough	11:14
Paddington	11:38

6 minutes

4. What is one quarter of 60?

$$60 \div 4 = 15$$

5. What is the perimeter of this square?



10 cm

$$10 \times 4 = 40 \text{ cm}$$

Place value

(a) **Add** together 1740 and 282

 **2022** 1 mark

(b) Now **add** together 17.4 and 2.82
You can use part (a) to help you.

 **20.22** 1 mark

(c) $3.5 + 2.35$ is **bigger** than $3.3 + 2.1$
How much bigger?

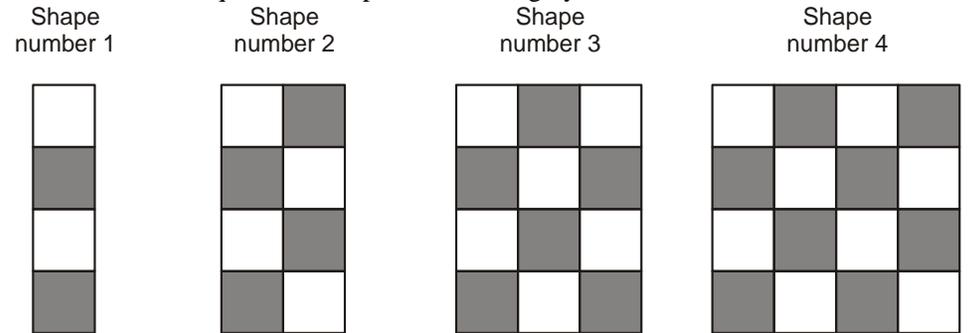


$3.5 + 2.35 = 5.85$
 $3.3 + 2.1 = 5.4$
 $5.85 - 5.4 = \mathbf{0.45}$

0.45 2 marks

Shapes on a grid

Here is a sequence of shapes made with grey and white tiles.



The number of grey tiles = 2 × the shape number
 The number of white tiles = 2 × the shape number

(a) Altogether, how many tiles will be in shape number 5?

$4 \times 5 = 20$  **20** tiles 1 mark

(b) Altogether, how many tiles will be in shape number 15?

$4 \times 15 = 60$  **60** tiles 1 mark

(c) Write the missing number below.

 The **total** number of tiles = **4** × the shape number

1 mark

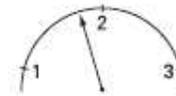
Mental Arithmetic Questions

6. Look at the numbers. Put a ring round the median.

The median is the middle number when all the numbers are in order.

4 9 **10** 13 20

7. Look at the scale. About what value is the arrow pointing to?



1.8

8. My birthday is 22 days after my friend's birthday. This year my friend's birthday is on a Monday. On what day will my birthday be this year?

Monday will be every 7 days, so after 3 weeks ($3 \times 7 = 21$ days) it will be Monday. This means the 22nd day will be a Tuesday.

9. The longest flight of stairs in the world is in Switzerland. There are 11 674 steps. Write this number to the nearest thousand.

12 000

10. What is the largest number that will divide exactly into 12 and 20?

$12 \times 5 = 60$
 $20 \times 3 = 60$
So **60**

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Level 4 Answers

Day 8

Computation

- (a) Add together **3.7** and **6.5**

 **10.2**

1 mark

- (b) Subtract **5.7** from **15.2**

 **9.5**

1 mark

- (c) Multiply **254** by **5**

Quick Method: Multiply by 10 then half your answer!

..... **1270**

1 mark

- (d) Divide **342** by **6**

Quick Method: Multiply by 2, then multiply by 3!

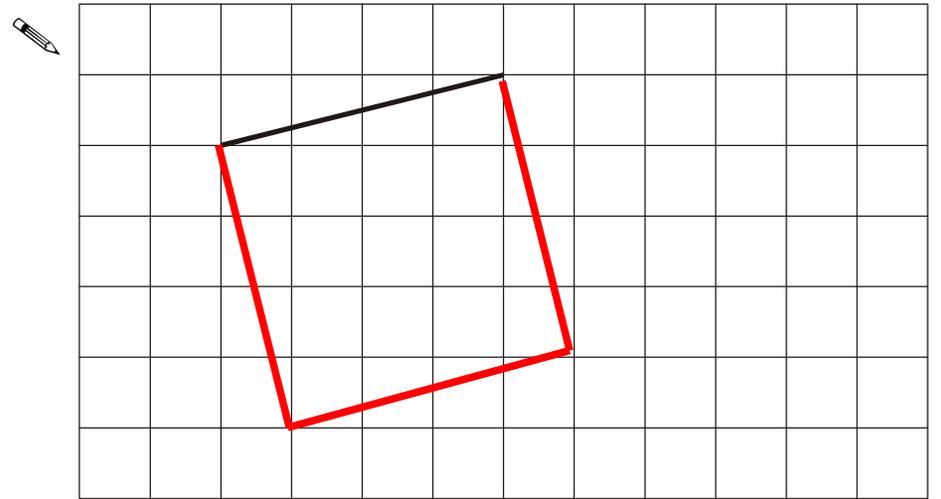
..... **57**

1 mark

You need to draw a trapezium. Two possibilities are shown.

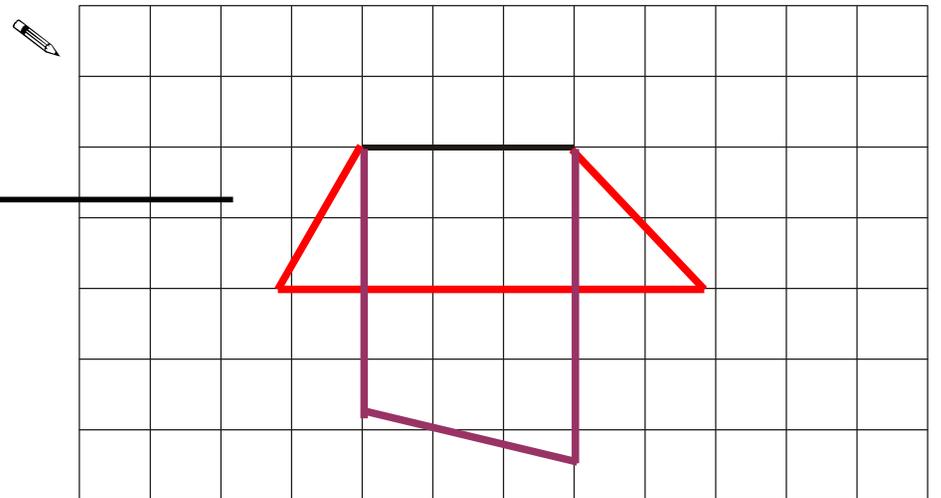
Completing quadrilaterals

- (a) The line on the square grid below is one side of a **square**.
Draw 3 more lines to complete the square.

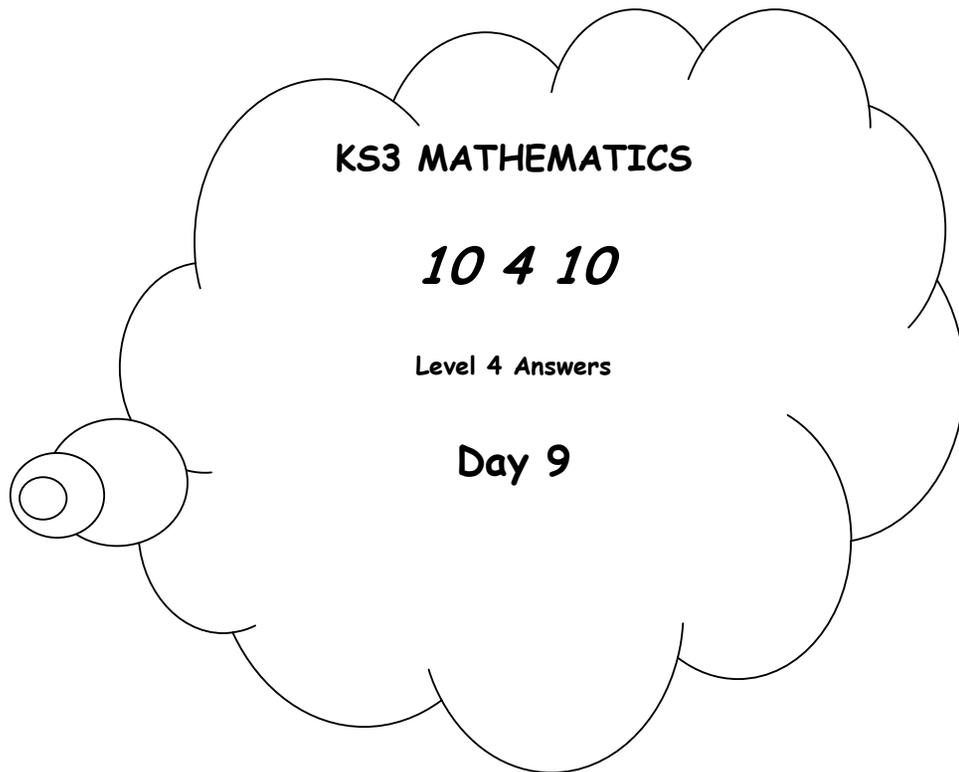


1 mark

- (b) The line on the square grid below is one side of a **quadrilateral**.
The quadrilateral has **only one pair of parallel sides**.
Draw 3 more lines to show what the quadrilateral could be.



1 mark



Mental Arithmetic Questions

1. I buy a notebook for 50p. How much change should I get from a £2 coin?

$$\pounds 2 - 50\text{p} = \pounds 1.50$$

2. Add these numbers: $25 + 28$

53

3. A train leaves at 10:30 am and travels for 4 hours. At what time does the train stop? Write your answer using am or pm.

2:30 pm

4. I am counting back in steps of 10. Write down the next number.

125, 115, 105, 95

5. What is half of seven?

3.5

Signs

Use +, -, × or ÷ to make each calculation correct.

Examples:

2+..... 4 = 7-..... 1

5×..... 3 = 3×..... 5



5+..... 2 = 10 - 3

12 -..... 3 = 3 ×..... 3

2 +..... 1 = 9 ÷..... 3

6 ÷..... 6 = 7 ÷..... 7

1 mark

1 mark

1 mark

1 mark

Survey results

(a) Jackie asked **27** people:

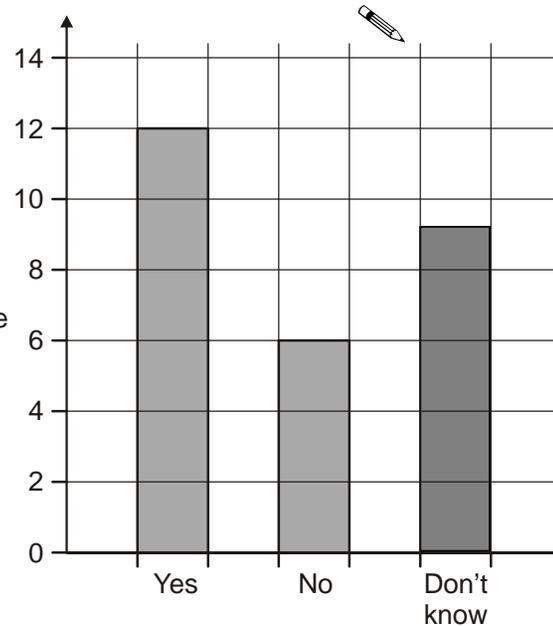
‘Do you like school dinners?’

The bar chart shows her results for ‘Yes’ and ‘No’.

Complete the bar chart to show her result for ‘Don’t know’.

12 for Yes
plus 6 for No
makes 18.
27 - 18 = 9

Number of people

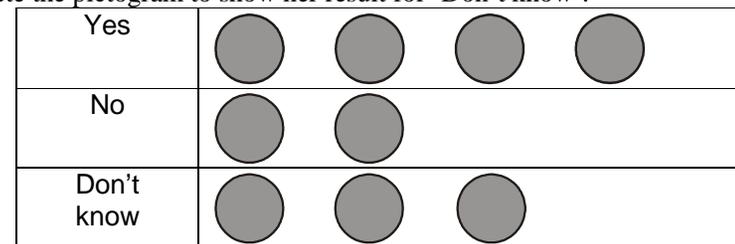


1 mark

(b) This pictogram also shows her results for ‘Yes’ and ‘No’.

Complete the pictogram to show her result for ‘Don’t know’.

No has two circles for a total of 6. This means each circle is worth 3 people. So for 9 people we need 3 circles



1 mark

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Level 4 Answers

Day 10

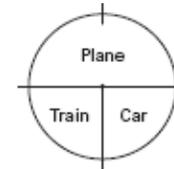
Mental Arithmetic Questions

1. Look at the temperatures below. Put a ring round the temperature that is the lowest.

-1°C 5°C **-3°C**
2°C 0°C

2. 600 people went on holiday. The pie chart shows how they travelled. How many people travelled by car?

A quarter of the pie is Car, so a quarter of 600 gives **150 people**



3. Write down an even number that is a multiple of seven.

14 or 28 or 42, etc.

4. Two rulers cost 80p. How much do 3 rulers cost?

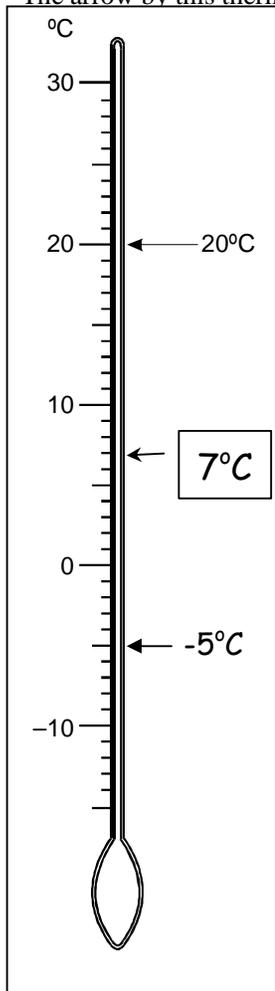
One ruler costs $80 \div 2 = 40$ p.
So 3×40 p gives 120 or **£1.20**

5. How many seconds are there in one and a half minutes?

60 seconds in one minute, so 30 seconds in half a minute, this gives **90 seconds** in one and a half minutes.

Temperature

The arrow by this thermometer shows a temperature of 20°C



- (a) Draw an arrow by the thermometer to show 7°C. Label your arrow 7°C

1 mark

- (b) Draw an arrow by the thermometer to show -5°C. Label your arrow -5°C

1 mark

- (c) In New York the temperature was -2°C
In Atlanta the temperature was 7°C warmer.
What was the temperature in Atlanta?

..... **5** °C

1 mark

- (d) In Amsterdam the temperature was 3°C
In Helsinki the temperature was -8°C
How many degrees warmer was it in Amsterdam than in Helsinki?

..... **11** °C

1 mark

Names

These are the names of the twelve people who work for a company.

Ali	Claire	Kiki	Suki
Brian	Claire	Lucy	Tom
Claire	James	Ryan	Tom

- (a) What name is the **mode**?

Mode means the most! **Claire**.....

1 mark

- (b) One person leaves the company. A different person joins the company. Now the name that is the **mode** is **Tom**. Write the missing names in the sentences below.

The name of the person who **leaves** is..... **Claire**.....

The name of the person who **joins** is..... **Tom**.....

1 mark

Television

I buy a widescreen television costing **£1290**

I pay **£900 now**, then

I pay the rest of the money in **3 equal payments**.

How much is each payment?

Show your working.

$£1290 - £900 = £390$

$£390 \div 3 = £130$

£130

2 marks