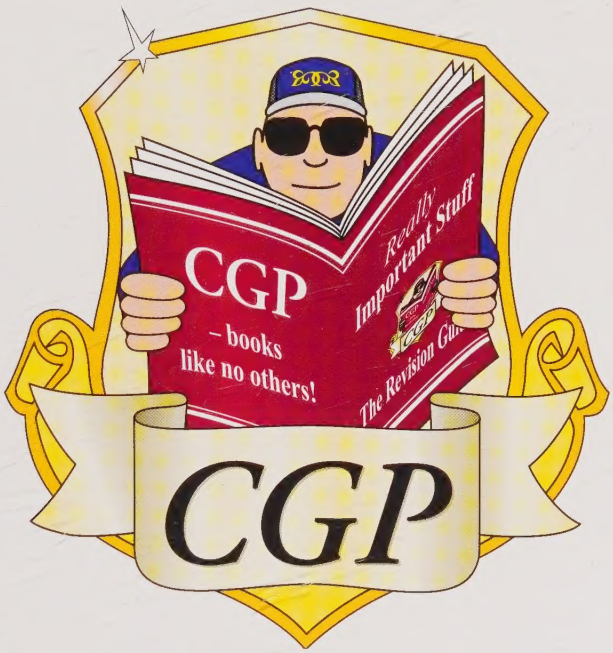
Name: ..... Class: .....

Key Stage Two
Maths



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About This Book

It's Full of Challenging Year 3 Maths Questions

This book is packed with challenging and interesting maths questions to deepen your understanding of Year 3 maths.

This book covers the Attainment Targets for Year 3 of the National Curriculum.

And it matches our Year 3 Study Book, which has all the maths you need to know for each topic.

The answers to all of the questions are at the back of this book.

Each topic ends with an enrichment activity like this. They get you to think more deeply about the maths on the page.

? A £1 coin is worth 100p. Jess has a piggy bank with only £1 coins, 10p coins and 1p coins in it. Find all the amounts of money that could be made with 10 of the coins.

You might have to look for alternative methods, find multiple answers or start your own investigation. Record your ideas and answers in an organised way — it will help you to spot patterns to solve the problem.

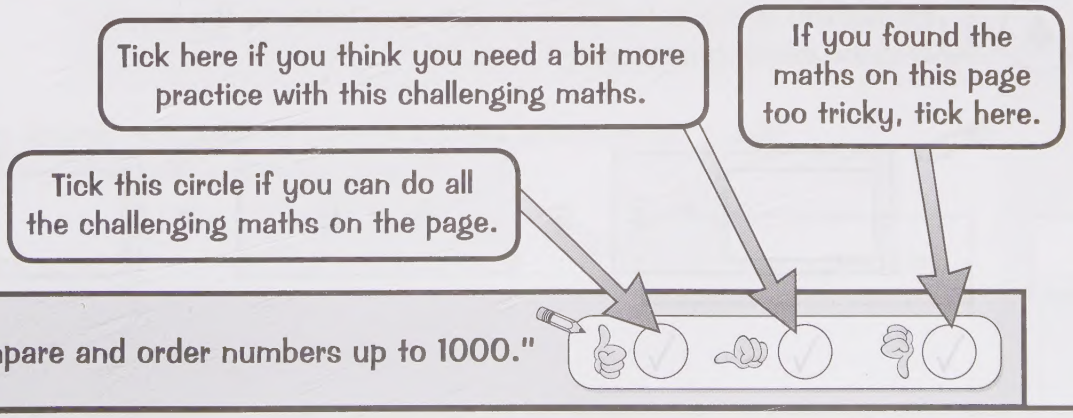
This book also has two tests. The one at the front of the book is to test how well you get on with regular Year 3 questions. The test at the back of the book is to see how well you can answer the challenging Year 3 questions from this book.

There are Learning Objectives on All Pages

The learning objectives say what you should already be able to do.

Printable checklists of all the objectives can be found at www.cgpbooks.co.uk/primarymaths.

Use the tick circles to show how confident you feel with the challenging maths questions on the page.



Year Three Objectives Test

1 Write five hundred and fourteen in numerals.

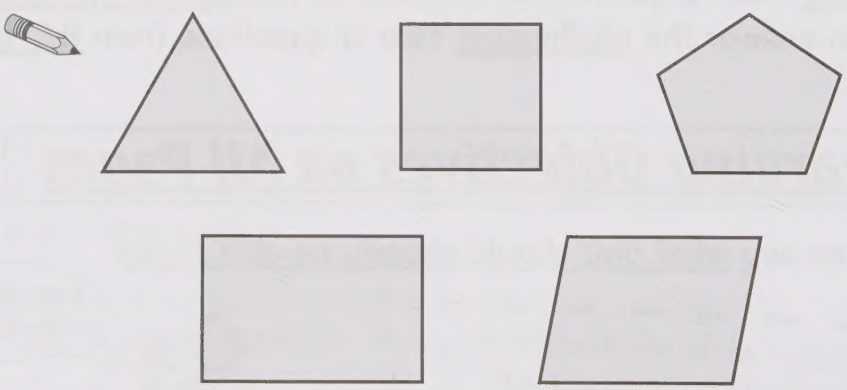
1 mark

2 Write a number in the box to make this sum correct.

+ 100 = 987

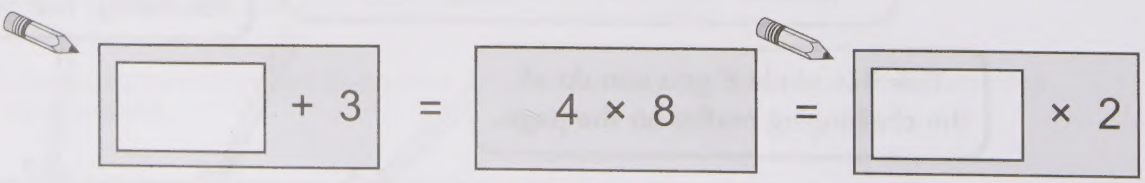
1 mark

3 Circle the shapes which have right angles.



2 marks

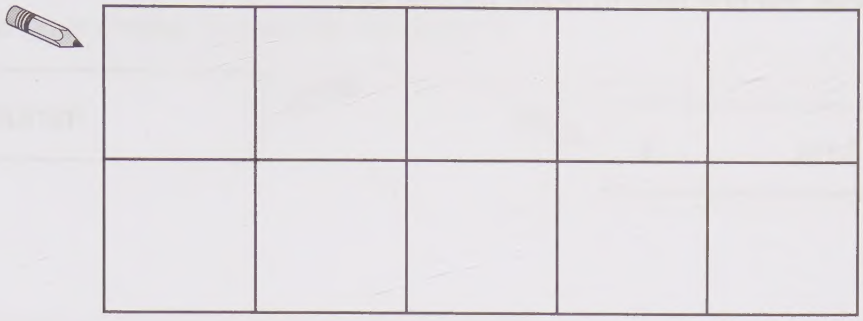
4 The answer to the calculation in each box below is the same.
Fill in the missing numbers.



+ 3 = 4 × 8 = × 2

2 marks

5 Shade in $\frac{2}{5}$ of the squares in the grid below.



1 mark

6 The table below shows the number of pupils in a school.

Year Group	Number of pupils
Year 3	104
Year 4	98
Year 5	112
Year 6	89

How many **fewer** pupils are there in Year 6 than in Year 3?

pupils

1 mark

How many pupils are there in Year 4 and Year 5 in **total**?

pupils

1 mark

7 There are fifty pencils in a pack.

How many pencils are there in eight packs?

pencils

1 mark

A teacher shares one pack of pencils equally between ten pupils.
How many pencils does each pupil get?

pencils

1 mark

8 A bus sets off at 15:35 and arrives at its final stop at 16:20.

How long does the bus take to reach its final stop?

minutes

1 mark

9 The lengths of five worms are shown below.

Write the lengths in order from shortest to longest.

101 mm 86 mm 95 mm 79 mm 120 mm

mm	mm	mm	mm	mm
shortest				longest

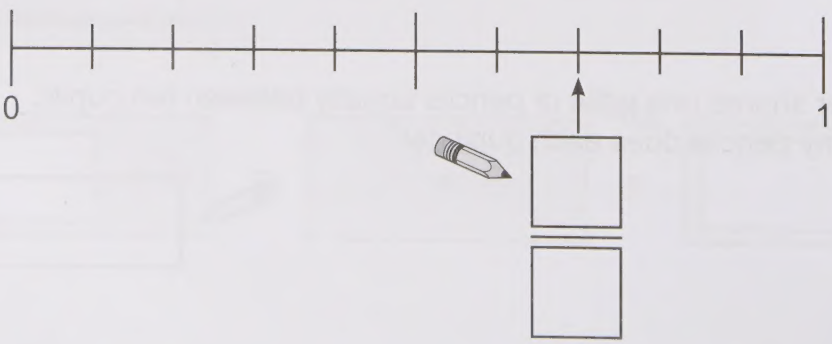
1 mark

10 Find the total number of days in April, May and June.

days

1 mark

11 Write the missing fraction on the number line below.



1 mark

12 Lauren buys two pens for 75p each, and a notebook for £2.
How much does she pay in total?

Give your answer in pounds and pence.

£ and p

1 mark

13 Work out the answer to the subtraction.

$$\frac{8}{9} - \frac{3}{9} = \frac{\square}{\square}$$

1 mark

14 Name each of the 3D shapes described below.

All of its faces are squares.

1 mark

It has four faces.
All of its faces are triangles.

1 mark

15 Look at the soup recipe below.

Tomato Soup — for two people
500 g tomatoes
620 ml stock
1 tbsp olive oil
Half an onion

Tariq wants to make soup for one person.
How much stock does he need?

ml

1 mark

Place Value

1 Use digits to write each number being described below.

It has 5 ones, 3 hundreds and 6 tens. ☐ 1 mark

It has no tens, 7 ones and 4 hundreds. ☐ 1 mark

2 Look at the list of numbers below.

Circle all the numbers which have a larger digit in the ones place than in the hundreds place.

483 729 390 564 879 28 ☐ 2 marks

What is the value of the digit 5 in the number 564 above? ☐ 1 mark

Which two numbers in the list have the same number of tens? and ☐ 1 mark

3 Look at the number cards below.

5	6	7	8

What is the smallest odd two-digit number you can make from the cards? ☐ 1 mark

What is the largest odd three-digit number you can make from the cards? ☐ 1 mark

?

Using the cards in question 3, write down three different three-digit numbers with a 7 in the hundreds column. How many could you write?

How many three-digit numbers could you make with a 5 in the tens column?

How many three-digit numbers are possible in total?

What is the best way of finding them all?

Would this work if you had more cards to choose from?

"I can recognise the place value of each digit in a three-digit number (hundreds, tens and ones)."

Reading and Writing Numbers

1 Felicity wants to add the two numbers written in words below.

Five hundred and sixteen

Two hundred and forty-three

Fill in the missing digits in the sum.

$$\begin{array}{r} 5\,\square\,\square \\ +\ \square\,4\,\square \\ \hline \end{array}$$

2 marks

Write the answer in words.

2 marks

2 Write in words the smallest odd number that is bigger than eight hundred and ninety-nine.

1 mark

3 Write in digits the number that is **two tens more** than the even number in the table.

Six hundred and five
One hundred and fourteen
Two hundred and twenty-one

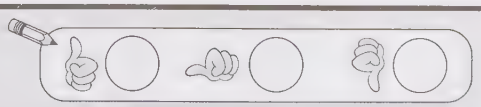
2 marks

? The word 'score' is an old way of saying twenty. 'Three score and ten' means three lots of twenty, plus ten, which equals seventy (70).

What number is 'four score and five'? How would you write the number 52? How many numbers between 1 and 100 can you write using 'score'?

Come up with your own word for a number less than 100. How many other numbers can you write using this word?

"I can read and write numbers up to 1000 in numerals and in words."



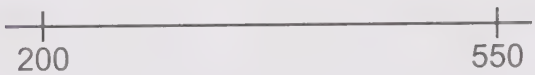
Counting in Multiples

1 The sequences below count up or down in equal steps.
Fill in the missing numbers in each of the sequences.

56 ☐ 72 80 ☐ ☐ 1 mark

☐ 36 ☐ 28 24 ☐ 1 mark

2 How many steps of 50 are there between 200 and 550?



steps ☐ 1 mark

3 By counting, show that 112 is a multiple of 8.

☐ 2 marks

4 There are 400 chairs arranged in 8 rows of 50 chairs for a school play.

For the next play, Bryn adds on 4 more rows of chairs.
How many chairs are there for the next play?

chairs ☐ 1 mark

? Write down a three-digit number. Starting at zero, count up in steps of 4, 8, 50 or 100 to try and reach the number — or get as close as possible.

For example: To reach 352, I count up 3 steps of 100, 6 steps of 8, and 1 step of 4. This is 3 + 6 + 1 = 10 steps in total.

Investigate ways of getting to your number in the smallest number of steps. What numbers can't be reached exactly, and why?

"I can count in multiples of 4, 8, 50 and 100."

10 or 100 More or Less

1 Write down two numbers that are two steps of 100 away from 475.

and

2 marks

2 Dan has 236 stickers. He buys another 8 packs of 10 stickers.

How many stickers does Dan have now?

stickers

1 mark

Dan's friend Abu has 396 stickers.
How many **more** packs of stickers should Dan buy to have the same number of stickers as Abu?

packs

1 mark

3 Zainab counts backwards from one hundred and sixty-two in steps of ten.

Circle all the numbers in the list that she could say.

10 26 92 100 102 126 132 172

2 marks

4 Kia adds 100 to a number by changing the hundreds digit.
She then adds 10 to the number by changing the tens digit.

Fill in the missing digits in Kia's calculation.

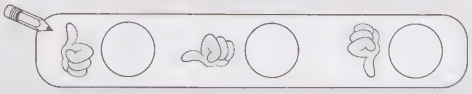
□04 + 100 + 10 = 9□□

2 marks

? To find 9 more than a number, first find 10 more, then take away 1.
For example: 28 + 9 = 28 + 10 – 1 = 38 – 1 = 37.

Try counting up from 37 in steps of 9 this way. How close to 100 can you get? What would you do to count down in steps of 9? How might you count up and down in steps of 99? Test out your method.

"I can find 10 or 100 more than a number, and 10 or 100 less than a number."



Ordering and Comparing Numbers

1 Maz is more than double the age of Jake. Jake is more than ten years older than Bina. Kat is the second oldest.

Draw lines to match each person to their age.

Jake	19
Kat	63
Maz	31
Bina	45

2 marks

2 Fill in the missing digits.

$415 > 4\square 6$ $\qquad$ $899 < \square 00$

2 marks

3 Write the numbers below in digits in size order. Start with the largest.

one hundred and fifteen | ninety | nine hundred and one | one hundred and nine | eighty-four

largest $\qquad\qquad$ smallest

2 marks

4 A jug contains more than 444 ml of juice but less than 555 ml.

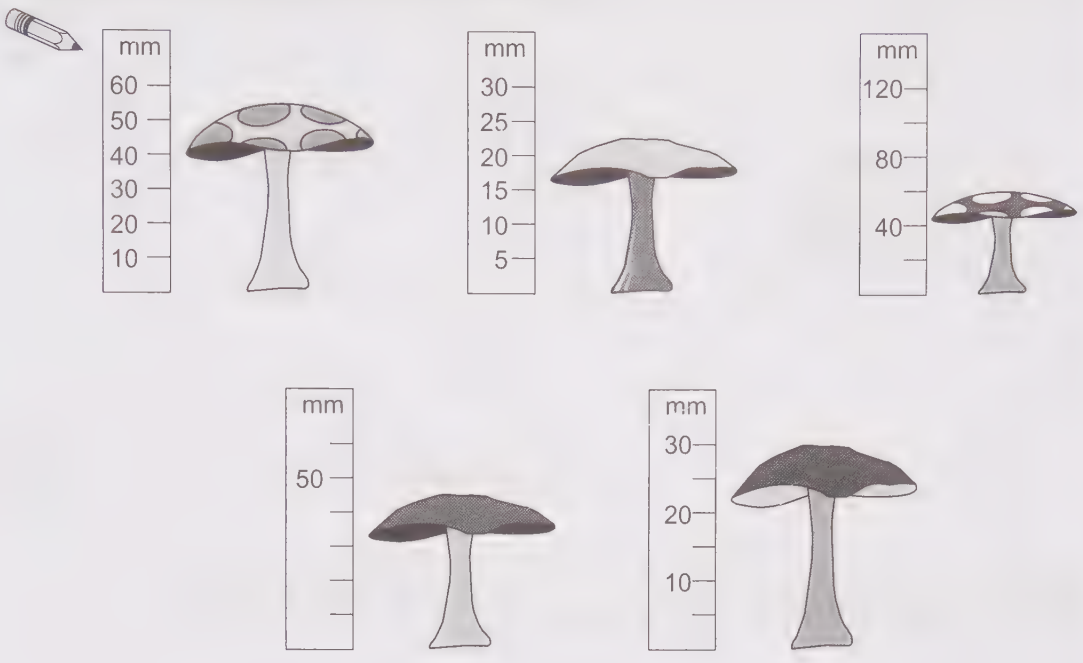
Circle all the possible amounts of juice in the jug.

564 ml $\quad$ 499 ml $\quad$ 439 ml $\quad$ 517 ml $\quad$ 556 ml

2 marks

Ordering and Comparing Numbers

5 Circle the second shortest mushroom.



1 mark

6 The tables below show the scores of six people on a computer game.
The person with the highest score is given the number '1' in the table.

Number the other players from 2-6, in order of their scores.

	Clementine	929
	Rosie	870
	Iman	901

	Bakool	807
1	Eva	946
	Stephen	898

2 marks

? Rosa has nine cards numbered with the digits: 1, 1, 3, 3, 5, 5, 7, 7 and 9.
She arranges all of the cards to make 3 three-digit numbers.
She then arranges these numbers in size order from smallest to largest, and writes them down using < signs between the numbers.

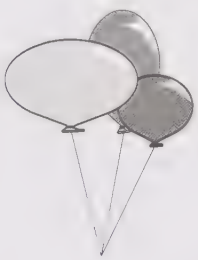
What answers might Rosa have written down? Find as many as you can.
You might find it helpful to make some number cards yourself.

"I can compare and order numbers up to 1000."

Partitioning

1 Balloons are sold in packs of 100, 30 or 5.
Saif needs to buy exactly 375 balloons, in the smallest number of packs.

How many of each pack should he buy?



[ ] packs of 100

\+ [ ] packs of 30

\+ [ ] packs of 5

[ ] 2 marks

2 Grace uses partitioning to add together 2 three-digit numbers.

Fill in the boxes with the missing numbers in her calculation.

[ ] + 795

= 700 + 100 + 40 + 60 + 30 + 5 + 4

= [ ]

[ ] 2 marks

3 Huw says, "The number 647 can be partitioned as 550 + 80 + 7."

Show that Huw is **wrong**.

[ ]

[ ] 2 marks

Change **one** of Huw's numbers to partition 647 correctly.

[ ] + [ ] + [ ] = 647

[ ] 1 mark

Partitioning

4 Two friends win a prize of £486.
They want to share the prize equally between them.

Partition £486 into £100s, £10s and £1s.

£ ☐ + £ ☐ + £ ☐ = £486 ☐ 1 mark

How much money does each person get? £ ☐ ☐ 1 mark

5 275 g of flour is needed to make a cake.

Use partitioning to work out the amount of flour needed for two cakes.
Show your working in the box below.

☐ g ☐ 2 marks

6 Sammy the slug moved 561 cm on Monday, 229 cm on Tuesday and 110 cm on Wednesday. Sammy had moved 1000 cm in total before Friday.

Use partitioning to work out how far Sammy moved on Thursday.
Show your working in the space below.

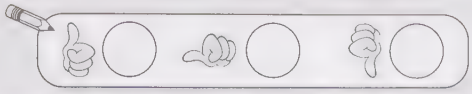
☐ cm ☐ 2 marks

? A £1 coin is worth 100p. Jess has a piggy bank with only £1 coins, 10p coins and 1p coins in it. She picks out 10 coins from her piggy bank.

What 10 coins did Jess pick if she had a total of £3.52? Is it possible for Jess to make a total of £2.90 with 10 coins? Can you explain why?

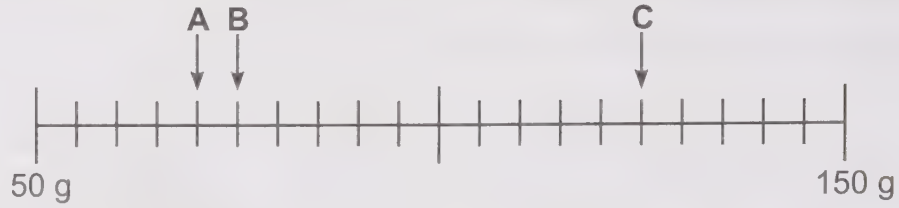
What is the smallest amount of money Jess could make? And the largest? Find all the possible amounts of money that she could make with 10 coins.

"I can use partitioning to show numbers in different ways."

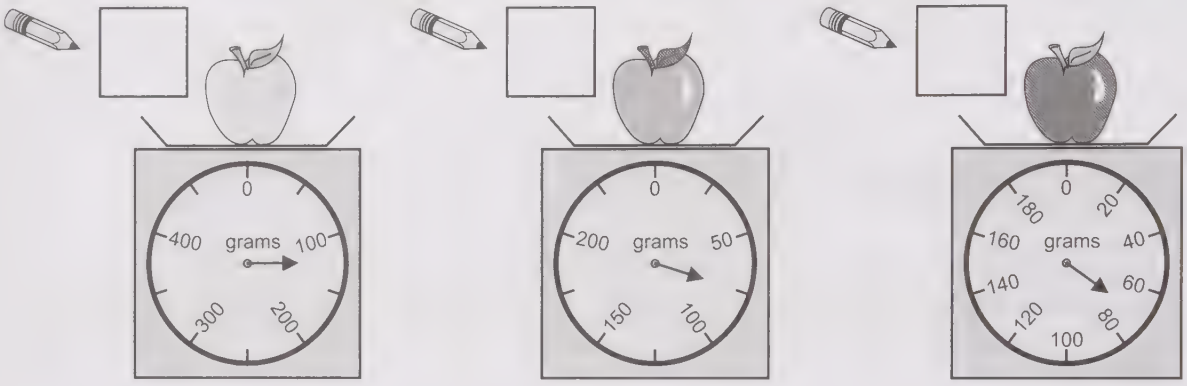


Numbers on Scales

1 The masses of three apples, A, B and C, are shown on the number line.



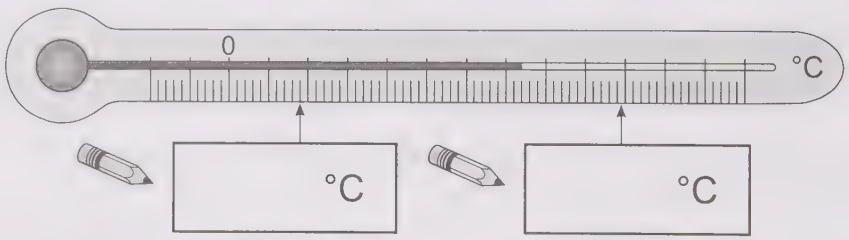
Write the letter of each apple next to the matching picture.



2 marks

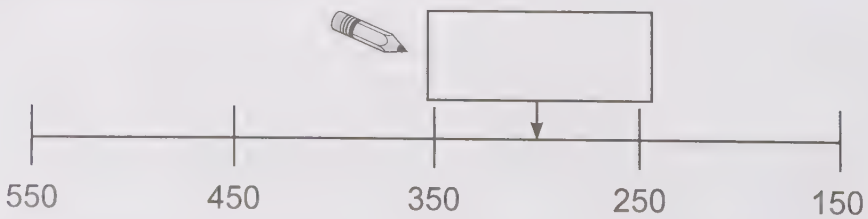
2 The thermometer below shows a temperature of 74 °C.

Fill in the boxes with other readings from the scale.

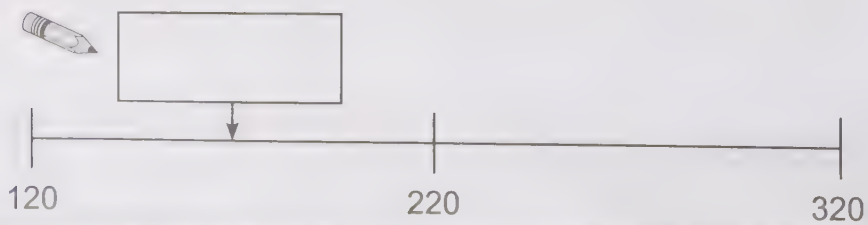


2 marks

3 For each number line below, estimate the number that the arrow is pointing to.



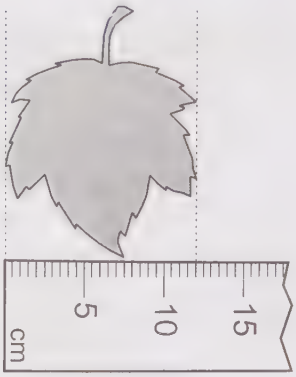
1 mark



1 mark

Numbers on Scales

4 Deepak measures the width of a leaf with a ruler:

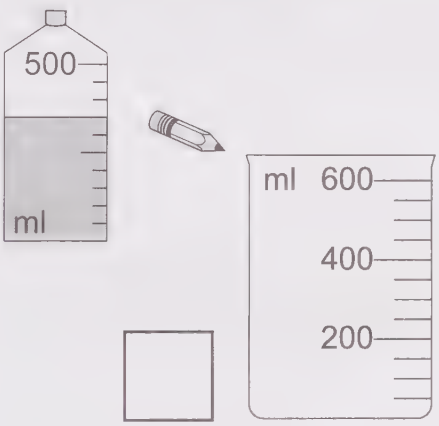


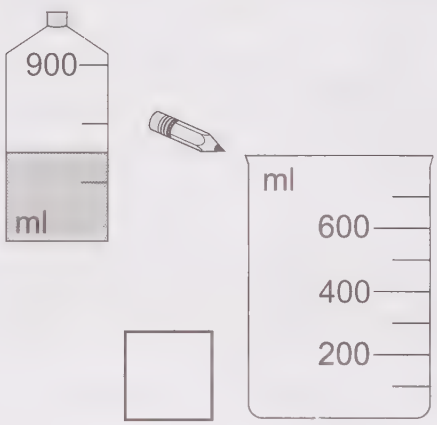
Draw an arrow (⟷) on the grey ruler below to show the width of the leaf, measured from 0.

☐ 2 marks

5 Alex empties water from bottles into beakers with different scales.

Shade in each beaker to show the water level.





☐ 2 marks

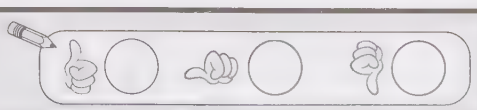
Put a tick in the box next to the beaker that contains the **most** water.

☐ 1 mark

? Sarah wants to turn a strip of paper, that is exactly 30 cm wide, into a ruler:

She folds the strip in half left to right and unfolds it. She labels the left end of the strip as '0 cm'. What should she write on the fold mark?
Experiment yourself with a strip of paper. How could you make a scale with steps of 5 cm, without measuring? Can you make any other scales?

"I can identify and estimate numbers on different number lines and scales."



Solving Number Problems

1 Jean-Paul reads the sentence below in a news story:

> The number of people in the crowd was between four hundred and fifty and five hundred and forty.

Tick the box next to the number of people that could have been in the crowd.

☐ four hundred and forty-five ☐ five hundred and forty-five

☐ four hundred and fifty-five ☐ five hundred and fifty-five

☐ 1 mark

2 Brett has half of a bag of 462 sweets.
Mat has two bags with 105 sweets in each.

Write the number of sweets that each person has in the correct boxes.

[sweets] < [sweets]

☐ 2 marks

3 Jasmina has £999. She gives away £100 to each of her three children.
She then gives away £10 to each of her seven grandchildren.

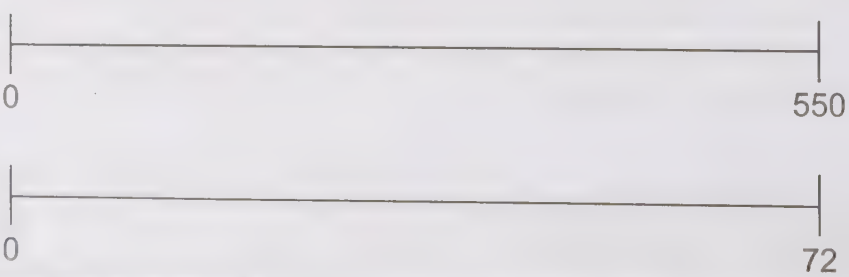
How much money does Jasmina have left?

£ [ ]

☐ 1 mark

4 Helen the hare travels 550 cm in hops of 50 cm.
Freda the frog travels 72 cm in hops of 8 cm.

Use the number lines to show that Helen makes the higher number of hops.

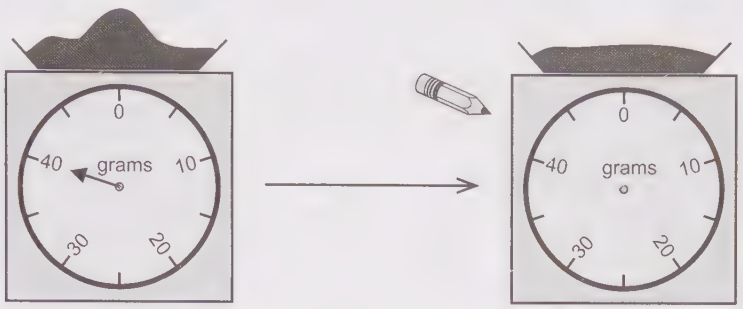


☐ 2 marks

Solving Number Problems

5 Selasi measures out 40 g of cocoa. He takes away the cocoa one spoon at a time. Each spoon holds 4 g of cocoa.

Estimate the position of the arrow on the scale after **6 spoons** have been taken away.



2 marks

6 Red dice are sold in packs of 100, 20 and 2.
Blue dice are sold in packs of 50 and 10, or as single dice.

Chloe buys 5 packs of 50, 2 packs of 10 and 8 single blue dice.
How many blue dice does she have?

blue dice

1 mark

She wants to buy exactly the same number of red dice.
Work out the **smallest total number of packs** of red dice she needs.
Show your working in the box below.

= packs of red dice

2 marks

?

Players in a game have to take seven tokens from a bag.
Tokens are either worth 100 points, 10 points or 1 point.

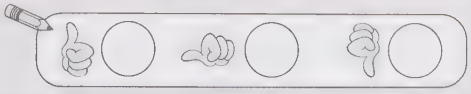
Jack has 421 points from his tokens. What tokens does he have?

Kelis has more points than Jack. How many points could she have?
How many different answers are there to that question?

Louis has the lowest number of points.
What is the largest possible points difference between Kelis and Louis?

How would your answers change if some tokens were worth 200 points?

"I can solve problems using the things I've learnt about numbers."



Mental Addition

This page is on **mental** addition, so you need to do these sums in your head.

1 Draw lines to match these calculations with their answers.
Then fill in the box with the missing answer.

212 + 8 231 + 90 267 + 60 228 + 9

[ ] 237 321 220

2 marks

2 Calculate these sums.

seven hundred and seventy nine plus forty [ ] 1 mark

two hundred and eighty five plus sixty [ ] 1 mark

ninety plus three hundred and twenty one [ ] 1 mark

3 Fill in the missing numbers to make these sums correct.

733 + [ ] = 813 [ ] + 919 = 927

2 marks

?

Sunita, Urma and Mina worked out 547 + 95 in different ways.
Sunita says, "I added on 90 and then subtracted 5."
Urma says, "I added on 3 and then added on 90."
Mina says, "I added on 100 and then subtracted 5."
Who got the right answer? Explain why the other ways are wrong.
Change one thing about each of the wrong ways to make them right.
Are there any other ways to work out this sum? Write as many as you can.

"I can add 1s, 10s and 100s to a 3-digit number."

Mental Subtraction

This page is on **mental** subtraction, so you need to do these calculations in your head.

1 Circle the calculation with the highest answer.

754 – 60 937 – 200 740 – 6 799 – 70

1 mark

2 What number is subtracted from 547 to get:

five hundred and seventeen? _____

1 mark

three hundred and forty seven? _____

1 mark

five hundred and thirty nine? _____

1 mark

3 Fill in the missing number to make this calculation correct.

718 – ☐ = 628

1 mark

4 Chris has 673 pennies. He gives 200 away and loses 80.

How many pennies does Chris have left?
Show the calculations you do in the space below.

_____ pennies

2 marks

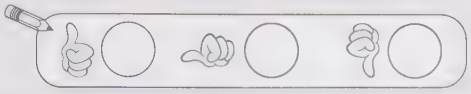
? Roll a dice numbered 1 to 6 four times. Write each of the numbers you get in one of the empty boxes below (with the biggest in the first box). Work out the answer to the calculation in your head.

☐☐0 – ☐0☐ = ?

Roll again to get new numbers. Arrange them to try to get a bigger answer than before. Repeat this a few times, trying for bigger answers each time.

What would be the biggest possible answer using any numbers from 1-6?

"I can subtract 1s, 10s and 100s from a 3-digit number."



Written Addition

1 What is four hundred and sixty nine plus three hundred and eighty nine?

1 mark

2 Fill in the missing digits in each calculation below.

$$\begin{array}{r} 3\ 4\ \square \\ +\ 1\ 7\ 8 \\ \hline 5\ \square\ 4 \end{array}$$

$$\begin{array}{r} 6\ \square\ 7 \\ +\ \square\ 8\ 5 \\ \hline 9\ 6\ 2 \end{array}$$

3 marks

3 Find the total of 680, 209 and 75.

1 mark

? Copy the sum on the right, and fill in the boxes to give the highest answer possible:

- with no carrying needed
- by carrying once
- by carrying twice

Try again, this time finding the lowest answers possible.
Now try it all again using different digits in each box.
Explain how you did this.

$$\begin{array}{r} \square\ \square\ \square \\ +\ \square\ \square\ \square \\ \hline \\ \hline \end{array}$$

"I can add numbers with up to 3 digits using a written method."

Written Subtraction

1 What is eight hundred and four minus six hundred and ninety five?

1 mark

2 Sally subtracted 327 from 855 using the working shown below.

Circle the part of Sally's working that is **not** correct.

$$\begin{array}{r} {}^{7}\not{8}\,{}^{14}\not{5}\,{}^{1}5 \\ -\ 3\ 2\ 7 \\ \hline 4\ 2\ 8 \end{array}$$

1 mark

Work out the correct answer in the box below.

1 mark

3 What number is subtracted from 536 to get 199?

1 mark

? Roll a dice numbered 1 to 6 six times to make two 3-digit numbers. Put the bigger number in the top row and the smaller number in the answer row of a written subtraction, as shown here:

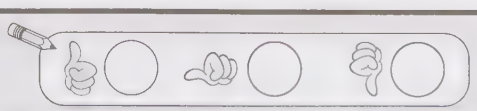
6	5	5
−		
4	3	6

Without working out the missing number, decide whether you'd need to exchange between columns to get the answer. Explain why. Now find the missing number. Were you right?

Have a go with some different numbers until you have found at least one subtraction where you:

- don't exchange
- exchange once
- exchange twice

"I can subtract numbers with up to 3 digits using a written method."



The 3, 4 and 8 Times Tables

1 Fill in the boxes to make these number sentences correct.

☐ × 2 = 6 × 4 4 × 4 = 2 × ☐

2 marks

2 Mr Mundi has a class of 32 pupils. He splits his class into more than one group of more than one pupil.

Give **two** different ways to split the class.

☐ groups of ☐

or ☐ groups of ☐

1 mark

3 Circle the numbers in the list that divide exactly by **both** 3 and 4.

16 32 21 12 36 24 33

2 marks

4 Depa has 60 glowsticks. She divides them between 8 people. Each person gets an equal amount. She keeps the rest for herself.

How many glowsticks does Depa keep for herself?
Show your working in the space below.

☐ glowsticks

2 marks

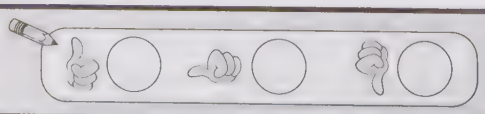
? Count up to 48 in steps of 3, 4 and 8 in a grid like this:
Use three different colours to colour in:

- multiples of 3 and 4 only
- multiples of 4 and 8 only
- multiples of 3, 4 and 8

How could you predict the next numbers that will be coloured in each of the different colours?

3	4	8
6	8	16
9	12	24
	16	

"I know my tables for 3, 4 and 8 and their division facts."



Using Times Tables Facts

1 Fill in the boxes with <, > or = to make these number sentences true.

72 ÷ 8 ☐ 45 ÷ 9

18 ÷ 3 ☐ 60 ÷ 10

35 ÷ 5 ☐ 48 ÷ 8

120 ÷ 12 ☐ 36 ÷ 3

☐ 2 marks

2 Draw lines to match the calculations to their answers.
Then fill in the missing answer.

270 ÷ 3 | 11 × 20 | 320 ÷ 40 | 16 × 6

☐ | 96 | 90 | 220

☐ 2 marks

3 Show how to use the calculation 8 × 8 to work out 640 ÷ 8.

☐ 1 mark

4 Kit swam lengths of a 50 m pool. He swam 400 m in total.

How many lengths of the pool did Kit swim?

☐ lengths ☐ 1 mark

5 A dog ate 3 chews each day in December and January.

How many chews did the dog eat in total?

☐ chews ☐ 1 mark

Using Times Tables Facts

6 Show how to work out 152 ÷ 8 using **partitioning**.

2 marks

7 Fill in the missing numbers in the grid multiplications below.

×	7
	560
	574

×	
50	
3	27

2 marks

8 Fill in the missing digits in these short divisions.

$$\begin{array}{r} \square\,3 \\ 8\overline{)\,3\;\;4\;\;{}^{2}4} \end{array}$$

$$\begin{array}{r} 1\;\square\;2 \\ 4\overline{)\,7\;\;{}^{3}6\;\;8} \end{array}$$

2 marks

9 Fill in the missing numbers in the calculations below.

$4 \times \square = 144$

1 mark

$735 \div \square = 5$

1 mark

? Pick a number from the 8 times table. Multiply it by 3.
Put the answer in place of the letter A in the number sentence: $\square \times \square = A$
How many different ways can you fill in the boxes?
Can you find a different starting number from the 8 times table that would give you more different ways of filling in the boxes?

"I can multiply and divide using my times tables and written methods."

Estimating and Checking

1 Keith thinks of a number. He divides it by 27 and gets 3.

Write a calculation to work out Keith's original number.

1 mark

2 Use estimation to find and circle the calculation with the answer 657.

854 – 167 194 + 563 912 – 275 219 + 438

1 mark

3 Ashley has 9 notebooks with 58 pages each.

She says, "The notebooks have a total of 612 pages."
Explain how you know Ashley is **not** correct without doing the calculation.

1 mark

4 Write inverse calculations to work out the missing number '**?**' in each of these calculations.

? + 407 = 652

1 mark

? ÷ 8 = 16

1 mark

538 – **?** = 360

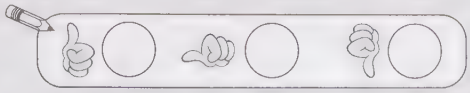
1 mark

?

Put +, –, × and ÷ into the box in this calculation: 96 ☐ 8 = ?
For each calculation:
- Estimate the answer.
- Decide if your estimate is higher or lower than the actual answer.
- Work out the answer to check if you are right.

Can you explain why you were right (or wrong)?
Write inverse calculations that you could use to check each exact answer.

"I can estimate the answer to a calculation and use inverse operations to check answers."



Solving Calculation Problems

1 Arlo has 24 crayons. The crayons are in four different colours and Arlo has an equal number of each colour.

How many crayons of each colour does Arlo have?

crayons

1 mark

2 A loaf of bread has a mass of 450 g. Each slice has a mass of 30 g.

How many slices of bread are there in **two** loaves of bread?
Show your working in the box below.

slices

2 marks

3 The members of a dance club are split into groups of 3.
Each group dances for 4 minutes. The dances last 72 minutes in total.

How many members are there in the dance club?
Show your working in the box below.

members

2 marks

4 Shakti has £45 in her bank account.
She had four times as much money before buying a bike.

How much did Shakti's bike cost? Show your working in the box below.

£

2 marks

Solving Calculation Problems

5 An apple has 5 pips. A crate can hold 48 apples.

How many pips will there be in all the apples in **half** of one crate?

pips

1 mark

6 There are two hundred and sixteen jelly beans in three packets.

How many jelly beans are there in **two** packets?

jelly beans

1 mark

7 Eoghan says,
"Multiplying a number by 4 will always give you a multiple of 8."

Is this sometimes, always or never true? Explain your answer.

1 mark

8 Carrie has a plank of wood that is 487 cm long.
She cuts off 295 cm and then splits the rest into 8 cm blocks.

How many blocks does Carrie get? Show your working in the space below.

blocks

2 marks

?

start → [ ] → [× ?] → [+ ?] → [ ] [ ] [ ] → end

Roll a dice 4 times and fill in one of the boxes above with the dice score each time. Replace the '?' in each of the shaded boxes with numbers that will take you from the start to the end. How many different ways of doing this can you find? Now try again with:

start → [ ] [ ] [ ] → [– ?] → [÷ ?] → [ ] → end

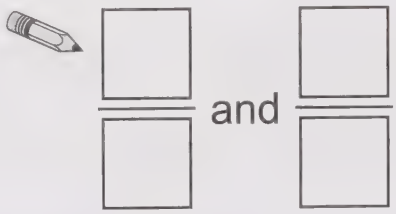
"I can solve problems by choosing the calculations I should do."

Counting in Tenths

1 Jo counts backwards by a number of tenths.
The first four numbers she says are:

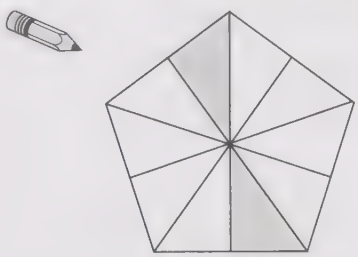
$$2 \qquad 1\frac{7}{10} \qquad 1\frac{4}{10} \qquad 1\frac{1}{10}$$

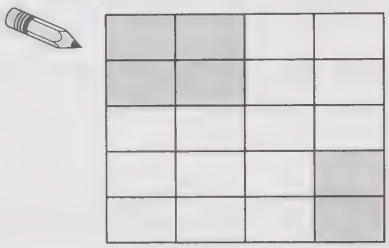
Find the next two fractions Jo will say.



2 marks

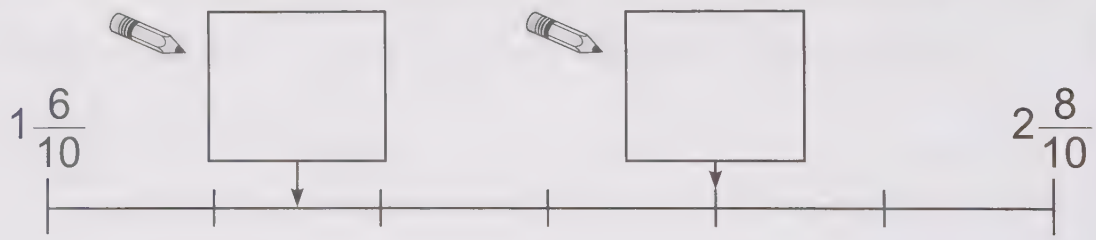
2 Complete the shading in the shapes below so that three tenths of each shape is **not** shaded.





2 marks

3 Look at this number line. Write the missing fractions in the boxes.



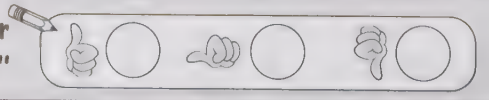
2 marks

? Four friends, Cath, Ade, Kim and Eno, want to share three chocolate bars. One bar is dark chocolate, one is milk and the other is white. All the bars are the same size. The friends break each bar up into tenths.

Cath doesn't like white chocolate and Kim doesn't like dark chocolate.

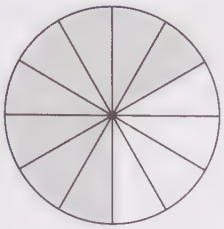
Find the fairest way to share out the bars with the least amount left over.
How many tenths of each bar should each friend get?
What other ways are there to do it? Why is your way the fairest?

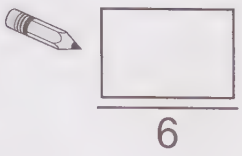
"I know that tenths come from dividing an object or number by 10. I can count up and down in tenths."



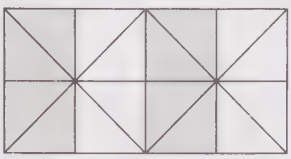
Equivalent Fractions

1 Write down the fraction of each shape below that is shaded.





$\frac{\square}{6}$

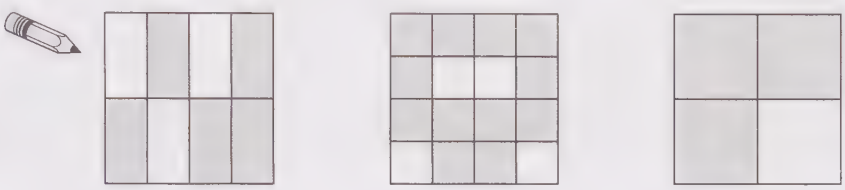


$\frac{\square}{8}$

2 marks

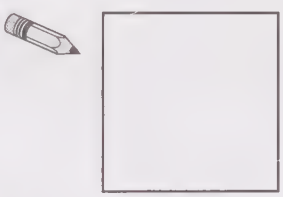
2 Look at these shapes.

Circle the shape that does **not** have a fraction shaded equal to the other two.



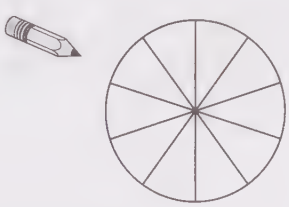
1 mark

Draw what the shape would look like if it **did** have an equal fraction shaded.

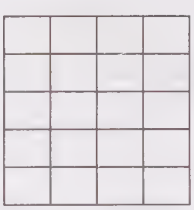


1 mark

3 Shade the shapes to match the fraction.



$= \frac{3}{10} =$



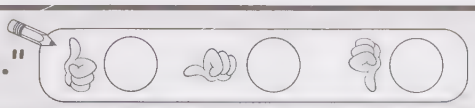
2 marks

? Pick a number between 1 and 9 and put it as the numerator in the fraction on the right. Then put a bigger number up to 10 as the denominator. How many of the shapes below could you shade to show this fraction? Only shade whole numbers of parts.

$\frac{\square}{\square}$

Try again with different numbers. How many fractions can you find where there is only one shape you can shade?

"I can recognise and draw equivalent fractions."



Ordering Fractions

1 The fractions below are in size order.

Fill in the boxes with the missing denominators.

$\frac{1}{12}$ $\frac{1}{\square}$ $\frac{1}{10}$ $\frac{1}{\square}$ $\frac{1}{8}$

1 mark

2 Circle the third largest fraction from the list below.

$\frac{7}{8}$ $\frac{4}{8}$ $\frac{1}{8}$ $\frac{5}{8}$ $\frac{2}{8}$ $\frac{6}{8}$

1 mark

3 Use the signs < or > to make these number sentences true.

$\frac{1}{7} \square \frac{1}{9}$ $\frac{1}{15} \square \frac{5}{15}$

$\frac{12}{18} \square \frac{2}{18}$ $\frac{1}{10} \square \frac{1}{3}$

2 marks

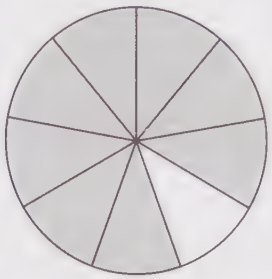
4 Preet and Gary each have a teapot containing the same amount of tea.
Preet shares her tea equally between 6 cups.
Gary shares his tea equally between 8 cups.

Whose cups will contain the largest amount of tea? Explain why.

1 mark

Ordering Fractions

5 Look at the shape below.



Circle all the fractions that are larger than the fraction of the shape **not** shaded.

$\frac{1}{8}$ $\frac{3}{9}$ $\frac{1}{10}$ $\frac{1}{18}$ $\frac{2}{9}$ $\frac{1}{6}$

2 marks

6 The lengths of some fish caught by Chaunice are shown below.

$\frac{5}{10}$ m $\frac{3}{10}$ m $\frac{8}{10}$ m $\frac{2}{10}$ m $\frac{7}{10}$ m

Find the difference in length between the largest and smallest fish. Show your working in the space below.

$\square$ m $\square$

2 marks

She has to throw back all the fish that measure less than $\frac{4}{10}$ m. What length is the largest fish she has to throw back?

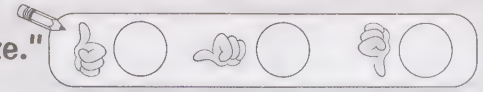
$\square$ m $\square$

1 mark

?

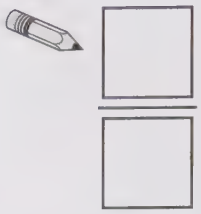
Use the number line to write down as many fractions as you can that are bigger than $\frac{2}{9}$ but smaller than $\frac{7}{9}$.
(Hint: You can divide the number line up into smaller steps.)
Which of the fractions you've found are equal to each other?

"I can compare and order fractions by their size."



Adding and Subtracting Fractions

1 What is the total of one ninth, three ninths and four ninths?



1 mark

2 Fill in the missing digits to make these number sentences correct.

$\frac{\square}{18} + \frac{8}{18} = \frac{6}{18} + \frac{10}{18}$ $\qquad$ $\frac{17}{20} - \frac{\square}{20} = \frac{5}{20} + \frac{3}{20}$

$\frac{\square}{15} - \frac{5}{15} < \frac{1}{15} + \frac{1}{15}$ $\qquad$ $\frac{13}{14} - \frac{11}{14} > \frac{\square}{14} - \frac{8}{14}$

4 marks

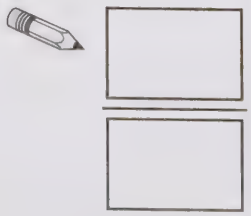
3 Circle the **two** fractions with a difference of $\frac{4}{13}$.

$\frac{11}{26}$ $\qquad$ $\frac{11}{13}$ $\qquad$ $\frac{14}{13}$ $\qquad$ $\frac{7}{13}$ $\qquad$ $\frac{8}{13}$

1 mark

4 In a test, Agata got $\frac{15}{17}$ questions correct.
Tess got $\frac{9}{17}$ fewer correct than Agata. Kyle got $\frac{6}{17}$ more correct than Tess.

What fraction of questions did Kyle get correct?



1 mark

Adding and Subtracting Fractions

5 Circle the **three** fractions with a total of $\frac{18}{24}$.

$\frac{7}{8}$ $\frac{6}{24}$ $\frac{5}{8}$ $\frac{7}{24}$ $\frac{6}{8}$ $\frac{5}{24}$

1 mark

6 Fill in the missing digits in these calculations.

$1 - \frac{3}{\square} = \frac{5}{\square}$ $\frac{6}{\square} + \frac{7}{\square} = 1$

$1 - \frac{9}{\square} = \frac{14}{\square}$ $\frac{25}{\square} + \frac{12}{\square} = 1$

4 marks

7 Iris recorded the fraction of pupils in her class with different eye colours in the table below.

Fill in the missing fraction in the table.

Brown	Blue	Green	Hazel
$\frac{13}{30}$	$\frac{8}{30}$	$\frac{\square}{\square}$	$\frac{3}{30}$

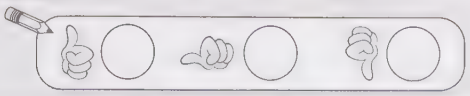
1 mark

? Roll a dice numbered 1 to 6 until you have two different numbers. Write your numbers as a fraction with the smallest as the numerator and the largest as the denominator, as shown on the right.

Find as many different ways as possible to make this fraction by adding or subtracting fractions.

$\frac{1}{4}$

"I can add and subtract fractions with the same denominator."



Fractions of Amounts

1 Circle the third largest amount from the list below.

$\frac{1}{3}$ of 30 $\frac{5}{6}$ of 24 $\frac{2}{5}$ of 40 $\frac{1}{8}$ of 88 $\frac{3}{4}$ of 16

1 mark

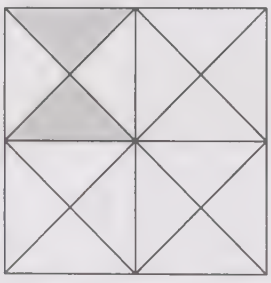
2 The total height of an iceberg is 22 m.
$\frac{2}{11}$ of the iceberg sticks out above the surface of the water.

How many metres of the iceberg are **below** the surface of the water?
Show your working in the box below.

m

2 marks

3 Complete the shading in the shape below so that five eighths of it is shaded.



1 mark

4 Ilias spent $\frac{1}{4}$ of 80p, then spent $\frac{1}{3}$ of what was left.

How much money does he have left? Show your working in the box below.

p

2 marks

Fractions of Amounts

5 Farmer Toggam has 35 geese on his farm.
Three fifths of his geese lay white eggs. The rest lay golden eggs.

How many of his geese lay golden eggs?

geese

1 mark

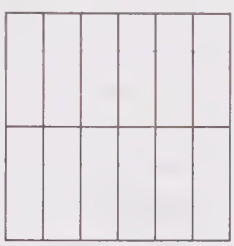
6 Jasmine's brother has £36. He says she can have either $\frac{5}{12}$ or $\frac{4}{9}$ of it.

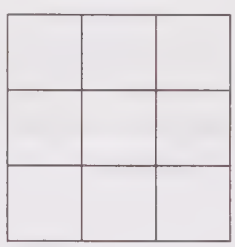
Circle the fraction that will give Jasmine the most money.

$\frac{5}{12}$ or $\frac{4}{9}$

1 mark

Check your answer by shading the grids below.





1 mark

7 Leo has 60 toy cars. $\frac{2}{5}$ of the cars are blue.
$\frac{1}{8}$ of the blue cars have a wheel missing.

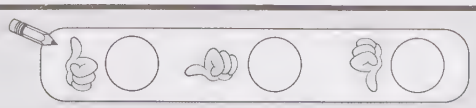
How many of Leo's cars are blue **and** have a wheel missing?
Show your working in the box below.

cars

2 marks

? Fran has no more than 100 sweets. She gives $\frac{3}{4}$ of her sweets to Olaf.
Olaf then gives $\frac{1}{2}$ of those sweets to Amina.
Investigate how many sweets Fran could have had to start with.
Would your answers be the same if the fractions were swapped?

"I can find a fraction of an amount, such as two fifths of 10."



Solving Fraction Problems

1 Irfan took £48 on holiday. Glyn took half as much.
Irfan spent $\frac{5}{8}$ of his money. Glyn spent $\frac{3}{4}$ of his money.

How much more money did Irfan spend than Glyn?
Show your working in the space below.

£ ☐ 2 marks

2 The masses of five fruits sold at a shop are shown in the table.

Fruit	Apple	Melon	Banana	Lime	Mango
Mass (kg)	$\frac{4}{20}$	$\frac{16}{20}$	$\frac{3}{20}$	$\frac{1}{20}$	$\frac{8}{20}$

Clarissa picks up three fruits with a total mass of $\frac{15}{20}$ kg.
What three fruits does she pick up?

, and ☐ 1 mark

Clarissa buys as many mangoes as she can that weigh less than 1 kg in total. How many limes should she buy to make the total mass 1 kg?
Show how you worked out your answer.

limes ☐ 1 mark

☐ 1 mark

3 Reese's favourite blanket was 32 inches wide.
It shrunk to $\frac{6}{8}$ of its size each time it was washed.

How wide was Reese's blanket after two washes?

inches ☐ 1 mark

Solving Fraction Problems

4 Liza ate $\frac{2}{12}$ of a 96 g chocolate bar and used the rest to decorate a cake.

What is the difference between the amount of chocolate she ate and the amount used to decorate the cake?
Show your working in the box below.

g

2 marks

5 A roll of sticky tape was originally 33 m long.
Xiang has used $\frac{1}{3}$ of it and Yosef has used $\frac{4}{11}$ of it.

What length of sticky tape is left in metres?
Show your working in the box below.

m

2 marks

6 Three people each poured the same amount from a jug containing 880 ml of squash. $\frac{1}{4}$ of the original amount of squash was left in the jug.

How much squash did each person pour out in millilitres?
Show your working in the box below.

ml

2 marks

? Fill in the boxes and shade the shape on the right so that each one shows two fifths.

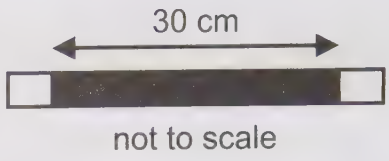
$\frac{\square}{5} + \frac{\square}{5}$, , $\frac{\square}{65}$

Draw more shapes and write more fractions and calculations to show two fifths — find as many different ways as you can.

"I can solve problems that involve fractions."

Length, Mass and Volume

1 Mimiko the Magician uses this magic wand.
The black section of the wand is 30 cm long.
Each white section is 40 mm long.



not to scale

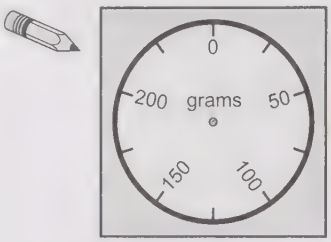
How long is the wand in millimetres?

mm

1 mark

2 A bag of identical potatoes weighs 4 kg 250 g.
If two potatoes are taken out, the bag weighs 4000 g.

Draw an arrow on the scale to show the mass of **one** potato.



1 mark

3 Lydia drinks three quarters of a 200 ml carton of juice.

How many millilitres of juice are left in the carton?

ml

1 mark

4 Three friends have measured their heights.

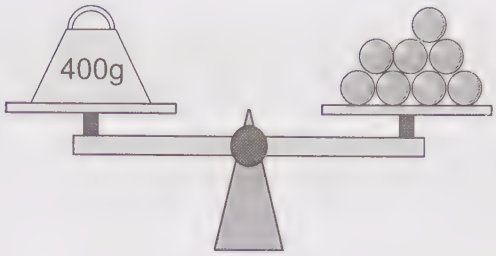
Aaron says, "I am 1 m 30 cm tall."
Bella says, "I am 120 cm tall."
Chuni says, "I am $1\frac{1}{4}$ m tall."

Who is the shortest? Show how you know.

2 marks

Length, Mass and Volume

5 A 400 g mass weighs the same as 8 marbles.



How many marbles weigh the same as a **1 kg** mass?
Show your working in the space below.

marbles

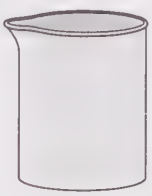
2 marks

6 The capacities of four containers (A, B, C and D) are shown below.

A

$1\frac{1}{2}$ litres

B

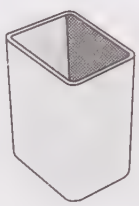


1000 ml

C

1 litre 200 ml

D



$\frac{1}{4}$ of 8 litres

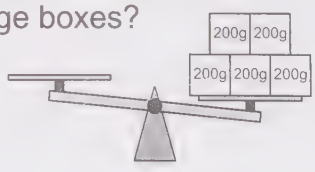
Put the letters of the containers in order. Start with the smallest capacity.

smallest capacity → largest capacity

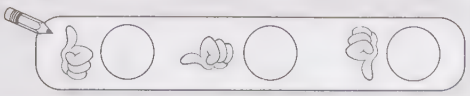
2 marks

? A large box weighs 400 g, a medium box 200 g and a small box 100 g. Lily puts five medium boxes on some scales. How many different ways can you balance the scales using small, medium or large boxes? How can you be sure you haven't missed any?

If Lily had ten boxes in total, investigate the different ways she could arrange them to balance the scales.

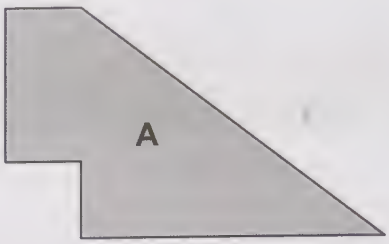


"I can compare, add and subtract lengths, masses and volumes."



Perimeter

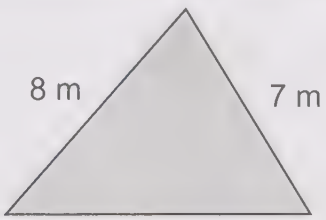
1 Measure the perimeter of Shape A.



Draw a rectangle on the centimetre square grid with the **same perimeter** as Shape A.

1 mark

2 The perimeter of the triangle below is 24 m.

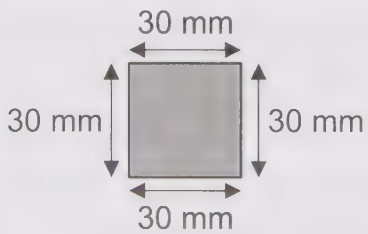


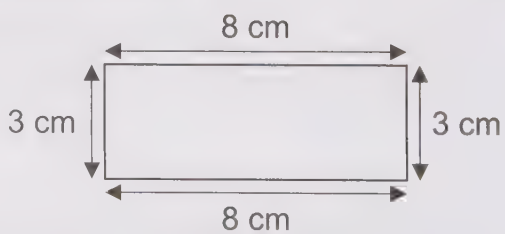
What is the length of the missing side?

m

1 mark

3 Look at the square and the rectangle below.





How much larger is the perimeter of the rectangle than the square?
Give your answer in millimetres. Show your working in the space below.

mm

2 marks

Perimeter

4 Tabitha measures the perimeter of a square.
Each side length is a whole number of centimetres.

She says, "The perimeter is 15 cm." Explain why she is **not** correct.

1 mark

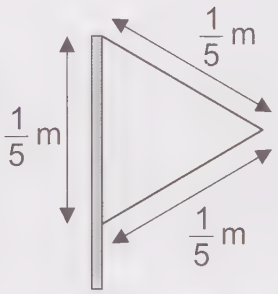
5 The perimeter of the rectangle on the right is less than 200 mm.

Each missing length A is a whole number of millimetres.
What is the **largest** that A could be?
Show your working in the space below.

mm

2 marks

6 Look at the triangular golf flag on the right.
Each side of the triangle is the same length.



Work out the perimeter of the golf flag.
Give your answer as a fraction of a metre.
Show your working in the space below.

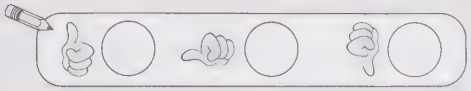
m

2 marks

? Draw five squares of different side lengths on centimetre squared paper.
Work out the perimeter of each square. What is the connection between the side length of a square and its perimeter?
Draw more squares to check if you are right.

Now choose one of the squares you have drawn. How many different shapes can you draw that have the same perimeter as your square?

"I can measure the perimeter of a 2D shape."



Money

1 These items are for sale in a bakery.

How much does it cost to buy three of the most expensive item?

£ ☐ 1 mark

Zac buys two of **one** item. He pays with four 50p coins and gets a 10p and 20p coin as change. Which item did he buy? Show how you know.

☐ 2 marks

2 Reggie starts with £2.50 in his piggy bank.
He puts four different coins in, and the new total is £4.25.

Tick the four coins he puts in his piggy bank.

1p	5p	10p	20p	50p	£1	£2
☐	☐	☐	☐	☐	☐	☐

☐ 1 mark

? Ezara has four 5p coins and four 10p coins.
How many ways can she share the money equally between her friends?
What is the biggest number of friends she can share the money between?
Does your answer change if she also has three 20p coins?

Sadiq has coins that add up to 50p. Investigate the different ways he can share them equally between his friends.

"I can add and subtract money to give change."

Clocks

1 Write the time shown by each clock face in 12-hour clock format.

: : ☐ 2 marks

2 Write the correct time in words.

10 minutes later → ☐ ☐ 1 mark

1 hour earlier → ☐ ☐ 1 mark

3 Bianca takes ten and a half minutes to cycle from home to school.
She cycles to school on one tenth of the total days in April.

How many **seconds** does it take her to cycle to school?

seconds ☐ 1 mark

How many days does she cycle in April?

days ☐ 1 mark

? The digital clock on the right is broken. Some of the lines are missing on each digit. List all the times it could be.
How can you be sure you have listed them all?
Could the clock show what the time is now? If not, how would it look?

"I can tell the time from 12 and 24 hour clocks.
I know how days are sorted into months and years."

Time Problems

1 It takes Liam 9 hours to drive from London to Edinburgh.

If he arrives in Edinburgh at 2:10 am, what time did he set off?
Write am or pm in your answer.

[:]

1 mark

2 Leigh checks his watch when he arrives at the zoo in the morning.

Arrives

He leaves 20 minutes **before** the zoo closes at 3:15 pm.
How long was he at the zoo for?

[hours minutes]

1 mark

3 Look at the school timetable below.
Each activity starts when the activity before finishes.

	Start Time	Finish Time
Maths	9:00 am	10:15 am
English	10:15 am	11:40 am
Break	11:40 am	11:55 am
P.E.	11:55 am	1:00 pm
Lunch	1:00 pm	1:55 pm
Music		
Science		

Use the information below to fill in the missing rows in the table.

- Music lasts for the same amount of time as Maths.
- Science is ten minutes shorter than P.E.

2 marks

Time Problems

4 Anne finished watching a film at 21:02.
The film lasted for 1 hour and 50 minutes.

When did the film **start**? Give your answer using the 24-hour clock.

: 1 mark

5 A train leaves Tunaston at ten past every hour.
It takes 2 hours and 15 minutes to get to Troutfield.

Cody catches the last train that leaves Tunaston in the **morning**.
When does he arrive in Troutfield? Write am or pm in your answer.

: 1 mark

6 Two friends took part in a race.

Alfie took 3 hours 10 minutes. He finished at 4:10 pm.
Bethany started at 2:30 pm. She finished 5 minutes later than Alfie.

How many minutes quicker did Bethany complete the race than Alfie?
Show your working in the box below.

minutes 2 marks

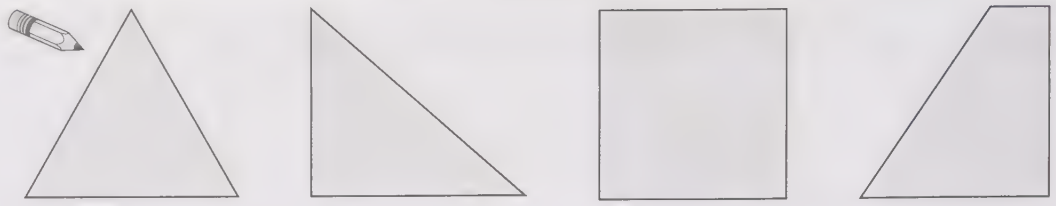
?

Write the time you went to bed yesterday and when you woke up today.
Can you work out how many minutes you were asleep for?
What time would you have to go to bed to sleep for exactly 500 minutes?
How many minutes today will you spend: in lessons / playing / eating?
Show how you will spend your time today, e.g. in a table or chart.

"I can compare different lengths of time.
I can work out how long an activity takes
and when an event starts or finishes."

2D Shapes

1 Circle the shape below that does **not** have a right angle.



1 mark

2 A teacher asks Damola to draw a shape with 4 sides and 4 right angles.
He says, "The shape I draw has to be a square."

Explain why he is **not** correct.

1 mark

3 Dot adds together the number of sides in a triangle and a heptagon.
She then multiplies the answer by the number of sides in an octagon.

What number does Dot get?

1 mark

4 Some shapes have been sorted into the table below.

All sides **must be** equal	All sides **not** always equal
Square	Rectangle
Isosceles triangle	Pentagon

Which shape is in the wrong position in the table?

1 mark

Name a shape that could go in that position instead.

1 mark

2D Shapes

5 Match the names to the shapes. One of the shapes is missing.

pentagon isosceles triangle square

octagon hexagon

1 mark

Draw the missing shape in this box.
Use a ruler.

1 mark

6 Bryce says, "Right-angled triangles have two equal sides."

Is this always, sometimes or never true? Explain why using diagrams.

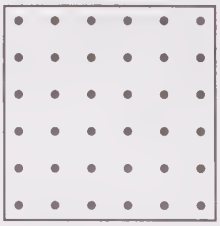
1 mark

?

Follow these instructions to draw a shape on the dotted grid:

- Starting at the top left dot, draw a line 2 dots down.
- Draw a line 3 dots across to the right.
- Draw a straight line back to the first dot.

What shape have you drawn?

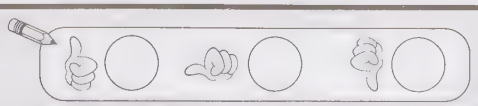


Write instructions to draw:

- a hexagon
- an isosceles triangle
- a quadrilateral with exactly two right angles
- another shape of your choice

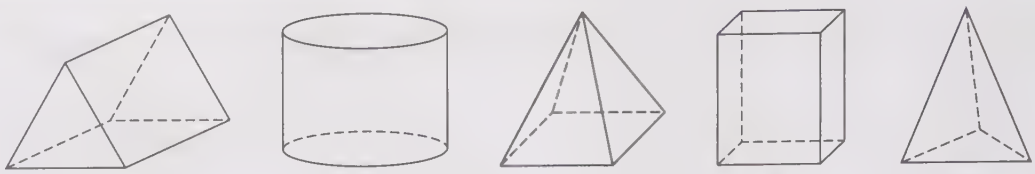
Swap your sets of instructions with a partner and have a go at drawing and naming each other's shapes.

"I can draw and describe 2D shapes."



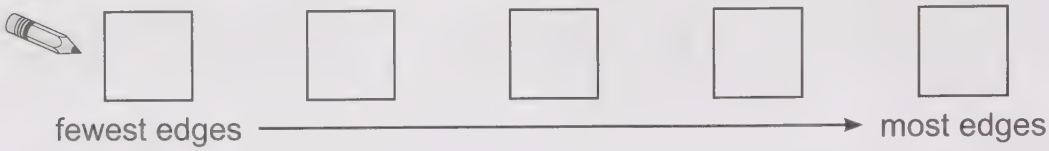
3D Shapes

1 Look at these 3D shapes.



A B C D E

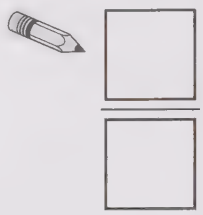
Write the letters of the shapes in order of the number of edges they have.



fewest edges → most edges

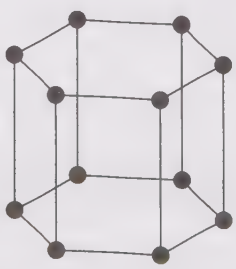
2 marks

What fraction of these shapes have **5 or more** vertices?



1 mark

2 A hexagonal prism has two identical hexagon faces at each end.
The shape below is a hexagonal prism made of sticks and balls of clay.



How many **more** sticks and balls of clay are needed to make an **octagonal** prism?

sticks and balls of clay

2 marks

3 Letitia thinks of a 3D shape with 6 faces and 12 edges.

How many more vertices than a cone does Letitia's shape have?

more vertices

1 mark

3D Shapes

4 Fill in the table with four shapes from the list below.

cube square-based pyramid tetrahedron

hexagonal prism pentagonal prism

Has an **equal** number of vertices and faces	Has **more** vertices than faces

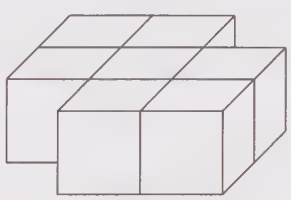
2 marks

Which two **prisms** from the list have a total of 13 faces?

and

1 mark

5 Rashid builds this shape using cube blocks.



What is the smallest number of cube blocks Rashid needs to add to his shape to make it into a larger cube?

cube blocks

1 mark

Solve this puzzle:
"The number of edges in a triangular prism subtracted from the number of vertices in a heptagonal prism equals the number of faces in what shape?"

Make up some puzzles of your own like this.
Try to include more than one calculation.
Swap your puzzles with a partner and see who can solve the most.

"I can recognise and describe 3D shapes."

Angles and Lines

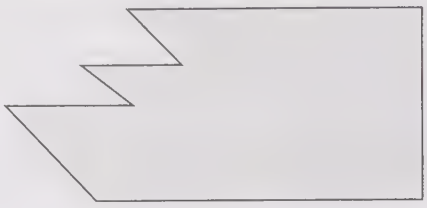
1 A wind-up toy moves 10 cm for every full turn of its key. Charlie turns the key through 20 right angles.

How far will the wind-up toy move in centimetres?

cm

1 mark

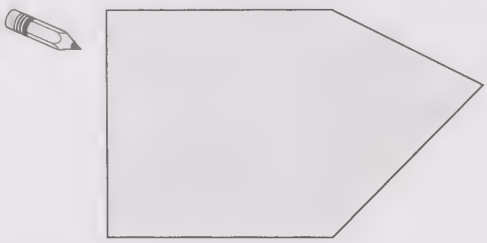
2 Look at the shape below.



How many more acute angles than right angles are there in this shape?

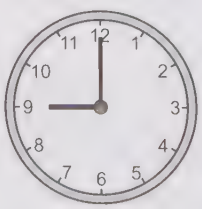
1 mark

3 Draw a single line between two vertices of the shape below so that there are no obtuse angles inside the shape.



1 mark

? Look at the clock on the right. How many right angles will the minute hand turn through before the minute hand and hour hand are both pointing exactly at the same number?

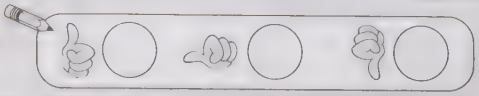


What time is it now? How many full right angles will the hour hand turn through before:

- you go to bed?
- you wake up tomorrow?
- the same time tomorrow?

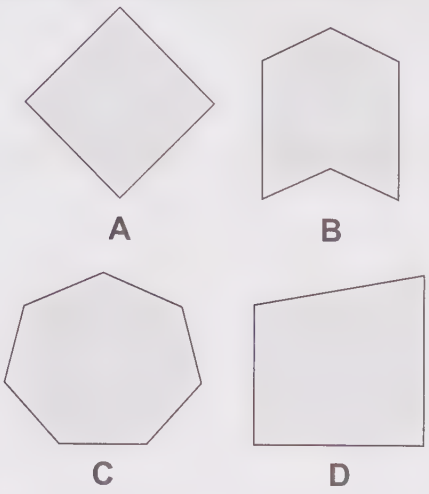
Use your answers to work out how many full right angles the minute hand will turn through in the same amounts of time.

"I know what a right angle is and how many right angles are in a ¼, ½, ¾ and full turn."



Angles and Lines

4 Look at the shapes below.



Which of these shapes has:

the **most** sets of parallel sides ☐ 1 mark

no parallel sides ☐ 1 mark

some parallel sides and **no** perpendicular sides ☐ 1 mark

5 Frankie says, "A line that is perpendicular to a vertical line will be parallel to a horizontal line."

Draw lines on the grid to show that she is correct. Use a ruler.

☐ 1 mark

6 Emlyn draws a shape with **one** set of perpendicular sides and **no** parallel sides. His shape has the fewest sides possible.

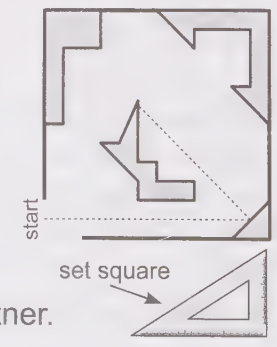
What shape did Emlyn draw?

☐ 1 mark

? Xenon the robot enters the maze shown on the right. Xenon moves in a straight line until he hits a wall. When Xenon hits a wall, he moves away from it in a line perpendicular to the wall, as shown. Use a set square to draw a path through the maze and back to the start.

Find a way for Xenon to enter the maze differently so that he only hits one wall before going back out.

Try making a maze like this yourself, then swap with a partner.



"I can identify horizontal, vertical, parallel and perpendicular lines."

Tables

1 Ronan asked all the pupils in his school what their favourite season is.

He has only recorded **half** of his results in this tally chart so far.

Season	Tally
Spring	𝍸 𝍸
Summer	𝍸 𝍸 𝍸 ||
Autumn	𝍸 𝍸 𝍸
Winter	𝍸 𝍸 |||

How many pupils are there **in total**?

pupils

1 mark

2 30 children were asked to draw a shape.

Complete the table.

Shape	Tally	Frequency
Triangle	𝍸 |||	8
Square	𝍸 𝍸 ||	
Pentagon		4
Hexagon		

1 mark

Tick the statements below that are **correct**.

☐ exactly 10 children drew a square

☐ exactly 20 children did **not** draw a hexagon

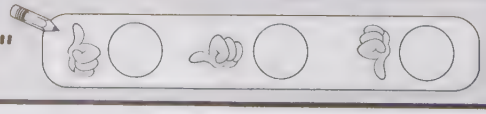
☐ one third of the children drew a shape with more than 4 sides

☐ the most popular shape was a square

2 marks

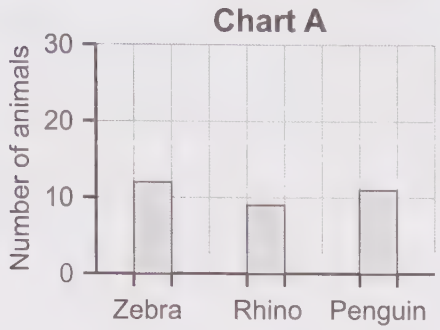
? Collect your own data — ask the pupils in your class for their favourite colour, pet, sport and one other "favourite thing" that interests you.
Record your results in tally charts and answer these questions for each:
What was the most popular option? What was least popular?
Did anyone say an option that you didn't expect?
Write down five different facts about the data in each tally chart.

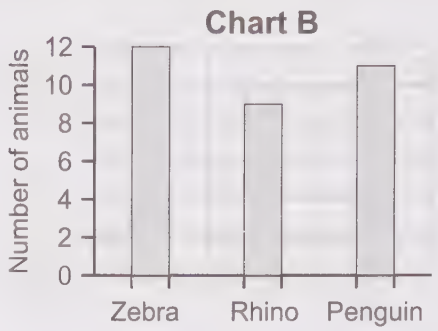
"I can interpret and present data using tables."



Bar Charts

1 Finley records the number of zebras, rhinos and penguins he sees at the zoo. He shows the same data in two bar charts.





Which bar chart is better to present his data? Explain your answer.

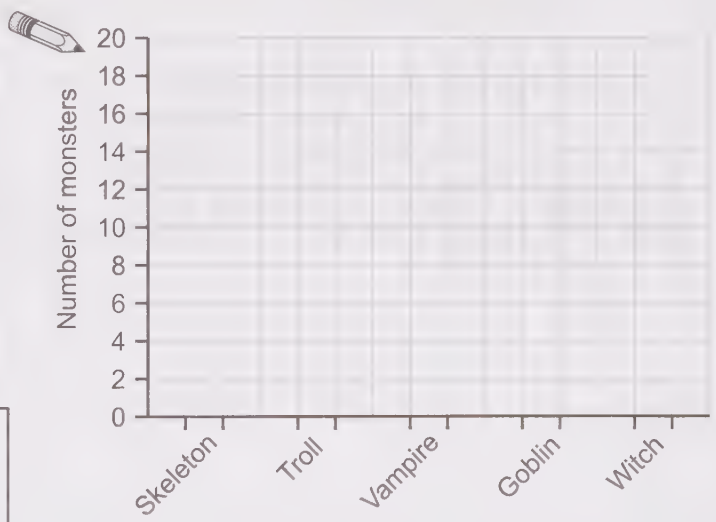
1 mark

2 An adventurer records how many monsters he finds in a cave.

Complete the bar chart using the table and information below.

Monster	Frequency
Skeleton	3
Troll	
Vampire	12
Goblin	9
Witch	

- There were twice as many trolls as goblins.
- There were two fewer witches than vampires.



2 marks

Look at the bar chart in Question 2. On squared paper, draw another bar chart to show the same data. Use a scale of 1 square for every 3 monsters.
Which bar chart did you find easier to draw? Explain why.
Use the bar charts to write as many facts as you can about the monsters.

"I can interpret and present data using bar charts."

Pictograms

1 Shreena has a flower shop. The pictogram below shows the number of flowers she sold on different days.

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

Key

= 8 flowers

She sold 32 flowers on Thursday. She sold 6 fewer flowers on Friday.
Add this information to the pictogram. 2 marks

How many **more** flowers did she sell on Friday than on Wednesday?

flowers 1 mark

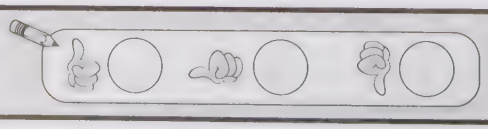
She sold 50 flowers on Saturday.
How many symbols would she draw to show this on her pictogram?

symbols 1 mark

? Look at Question 1. Draw two more pictograms to show the same data using a different number of flowers for each symbol. Which pictogram do you think is the best? Explain why.

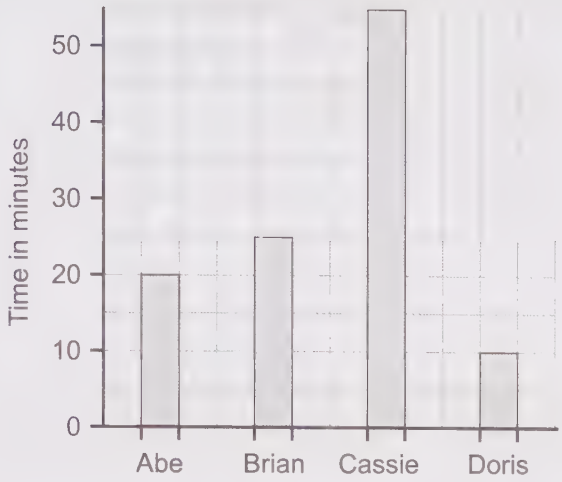
Look at page 52. Choose one of the tally charts (you could use your own if you've drawn some) and make a pictogram to show the data. The symbol you use should relate to the data and should stand for a number bigger than one. Explain your choice of symbol.

"I can interpret and present data using pictograms."



Interpreting Tables and Charts

1 The bar chart shows the time it takes four friends to get to school.



Brian says, "Cassie takes half an hour longer than me to get to school."

Is he correct? Circle **Yes** or **No**.

Yes / **No**

1 mark

Show your working in the box below.

1 mark

2 Three motorbikes need different amounts of fuel to make a journey.

The fuel they each need is shown in the pictogram but the key is missing.
A Fastor bike needs 5 litres of fuel less than a Zoom-E bike.

Bike	Litres of fuel
Zoom-E	
SP-33D	
Fastor	

How many litres of fuel does a SP-33D bike need? Show your working in the space below.

litres

2 marks

? The table shows the number of cartwheels some gymnasts performed during their routines.

Name	Ami	Bess	Clark	Dee
Cartwheels	7	2	4	5

Draw a bar chart to show this data.
Hint: Label the vertical axis as "number of cartwheels".

Draw a pictogram to show the data.
Explain the good and bad points about the key you have used.

"I can answer questions using information from tables, bar charts and pictograms."

Year Three Extension Test

1 The sequence below was made by counting in steps of the same number. Fill in the missing numbers to complete the sequence.

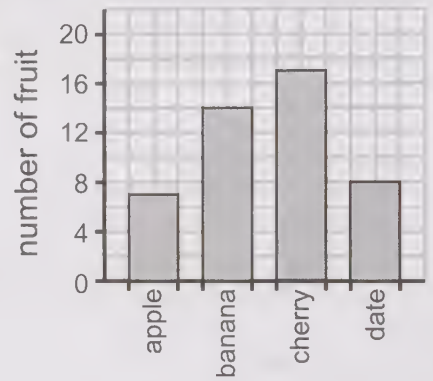
400 ☐ 300 250 ☐

☐ 1 mark

2 Asha makes a bar chart from the information in her tally chart.

Circle the bar on the bar chart that is **incorrect**.

	Tally
Apple	𝍸 ||
Banana	𝍸 𝍸 ||||
Cherry	𝍸 𝍸 𝍸
Date	𝍸 |||



☐ 1 mark

Fill in the boxes to complete the sentence.

The number of ☐ is half the number of ☐.

☐ 1 mark

3 Write in words the number that is described below.

- Smaller than five hundred and nine
- Larger than four hundred and ninety
- Digits add up to nine

☐

☐ 1 mark

4 Zak's clock is one hour behind the actual time.
The actual time is 21:29.

Draw hands on the clock to show the time that Zak's clock shows.

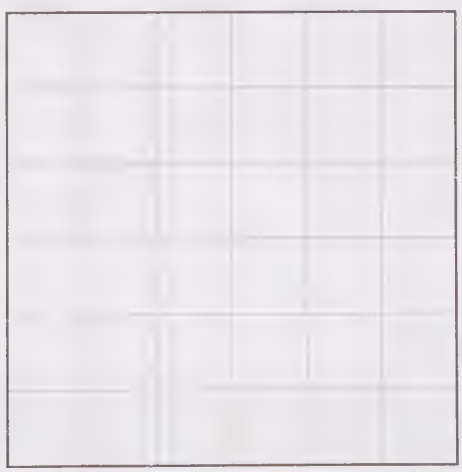
1 mark

5 What number less than 30 is a multiple of 3, 4 and 8?

1 mark

6 A quadrilateral has **one** pair of sides that are parallel and **no** sides that are perpendicular.

Draw what the shape could be on the grid.



1 mark

7 Circle the calculation with the smallest answer.

269 + 50 358 – 60 70 + 248

1 mark

8 Look at the fractions listed below.

Circle all the fractions that are smaller than $\frac{3}{10}$.

$\frac{4}{10}$ $\frac{1}{2}$ $\frac{2}{10}$ $\frac{3}{5}$ $\frac{3}{20}$ $\frac{6}{10}$

1 mark

Which **two** fractions in the list show the amount shaded in the shape below?

$\frac{\square}{\square}$ and $\frac{\square}{\square}$

2 marks

9 Bernie buys two comics. They cost £1.69 each. She pays with two £2 coins. Her change contains the smallest possible number of coins.

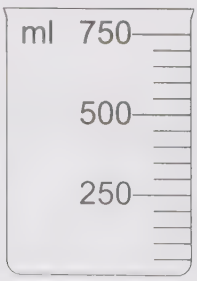
Tick the coins she gets as change.

1p	2p	5p	10p	20p	50p	£1
☐	☐	☐	☐	☐	☐	☐

1 mark

10 Nadya drinks 350 ml of a half-litre bottle of water. She pours the rest into the beaker shown below.

Draw a line to show the level of the water in the beaker.



1 mark

11 Fill in the missing digits in the calculation below.

$$\begin{array}{rcccc} & 5 & 3 & \square \\ + & 4 & \square & 7 \\ \hline \square & 7 & 5 \end{array}$$

2 marks

12 Rhys buys three packs of one hundred buttons and six packs of ten buttons.

He rearranges them into packs of forty.
How many packs of forty does he have?

packs

1 mark

13 Rita eats $\frac{3}{7}$ of a bag of popcorn and Mal eats $\frac{2}{7}$ of the bag.

What fraction of the bag is left?

$\frac{\square}{\square}$

1 mark

The full bag had 28 g of popcorn.
How much is left?

g

1 mark

14 Eddy has four pots of different coloured paints.
Each pot contains 370 ml. He pours 195 ml from each pot.

How much paint does he have left in the pots in total?
Show your working in the space below.

ml

2 marks

Total

Answers

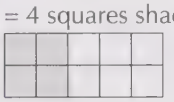
Pages 2-5 — Year Three Objectives Test

Q1 **514** *(1 mark)*

Q2 **887** + 100 = 987 *(1 mark)*

Q3 *(2 marks for both circled and no others, otherwise 1 mark for only one circled and/or an extra, incorrect shape circled)*

Q4 4 × 8 = 32
29 + 3 = 32 *(1 mark)*
16 × 2 = 32 *(1 mark)*

Q5 $\frac{2}{5}$ of 10 squares
= 10 ÷ 5 × 2 = 2 × 2
= 4 squares shaded, e.g.

(1 mark for four squares)

Q6 104 – 89 = **15 pupils** *(1 mark)*
98 + 112 = **210 pupils** *(1 mark)*

Q7 50 × 8 = **400 pencils** *(1 mark)*
50 ÷ 10 = **5 pencils** *(1 mark)*

Q8 15:35 + 25 minutes = 16:00
16:00 + 20 minutes = 16:20
25 + 20 = **45 minutes** *(1 mark)*

Q9 **79 mm, 86 mm, 95 mm, 101 mm, 120 mm** *(1 mark)*

Q10 30 + 31 + 30 = **91 days** *(1 mark)*

Q11 There are 10 intervals between 0 and 1, so each one is $\frac{1}{10}$. The arrow is 7 intervals above 0 = $\frac{7}{10}$ *(1 mark)*

Q12 75p + 75p = 150p
= £1 and 50p
£1 and 50p + £2 =
£3 and 50p *(1 mark)*

Q13 Subtract the numerators to give $\frac{5}{9}$ *(1 mark)*

Q14 **cube** *(1 mark)*

triangle-based pyramid (or **tetrahedron**) *(1 mark)*

Q15 620 ml = 600 ml + 20 ml
620 ml ÷ 2 = 300 ml + 10 ml
= **310 ml** *(1 mark)*

Section One — Number and Place Value

Page 6 — Place Value

Q1 **365** *(1 mark)*
407 *(1 mark)*

Q2 Compare the underlined digits in each number: 48<u>3</u>, 72<u>9</u>, 39<u>0</u>, 56<u>4</u>, 87<u>9</u>, 02<u>8</u>. The numbers **729**, **879** and **28** have a larger digit in the ones place than the hundreds *(2 marks for all three circled and no others, otherwise 1 mark for at least two circled with at most one incorrect answer)*

The digit 5 in 564 is worth **5 hundreds** or **500** *(1 mark)*

729 and **28** both have two tens *(1 mark)*

Q3 Choose the smallest digit for the tens, and the smallest remaining odd digit for the ones, to make **57** *(1 mark)*

Choose the largest digit for the hundreds, the next largest for the tens, and the largest remaining odd digit for the ones, to make **875** *(1 mark)*

Page 7 — Reading and Writing Numbers

Q1
$$\begin{array}{r} 5\ \mathbf{1}\ \mathbf{6} \\ +\mathbf{2}\ 4\ \mathbf{3} \\ \hline 7\ 5\ 9 \end{array}$$
(1 mark for the 1 and 6, 1 mark for the 2 and 3)

seven hundred and fifty-nine *(2 marks for the correct answer, otherwise 1 mark for an incorrect numerical answer written correctly in words)*

Q2 The smallest odd number above 899 is 901, which is **nine hundred and one** *(1 mark)*

Q3 114 + 10 + 10 = **134** *(2 marks for correct answer, otherwise 1 mark for identifying 114 as the even number)*

Page 8 — Counting in Multiples

Q1 The numbers are going up in steps of 8: 56, **64**, 72, 80, **88** *(1 mark for both)*

The numbers are going down in steps of 4: **40**, 36, **32**, 28, 24 *(1 mark for both)*

Q2 Counting up from 200: 250, 300, 350, 400, 450, 500, 550. So there are **7 steps** *(1 mark)*

Q3 Start counting in steps of 8 from a multiple of 8, e.g. 80, 88, 96, 104, **112** *(1 mark for counting in steps of 8 from 0 or a multiple of 8, 1 mark for correctly counting to 112)*

Q4 Count up from 400 in four steps of 50: 450, 500, 550, 600. So there are **600 chairs**. *(1 mark)*

Page 9 — 10 or 100 More or Less

Q1 Counting up two steps of 100 gives **675** *(1 mark)*
Counting down two steps of 100 gives **275** *(1 mark)*

Q2 Adding 8 lots of 10 to 236 gives 2<u>3</u>6 + <u>8</u>0 = **3<u>1</u>6 stickers** *(1 mark)*

3<u>9</u>6 is 8 tens more than 3<u>1</u>6. So he needs to buy **8 packs** *(1 mark)*

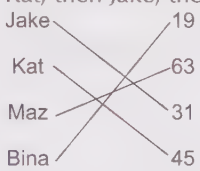
Answers

Q3 Circle numbers with 2 in the ones column, that are smaller than 162: **92**, **102** and **132**
(2 marks for all three circled and no others, otherwise 1 mark for at least two circled with at most one incorrect answer)

Q4 8 hundreds + 100 gives 9 hundreds, and 0 tens + 10 gives 1 ten. So the digits are: **8**04 + 100 + 10 = 9**14**
(2 marks for all three correct, otherwise 1 mark for two correct)

Pages 10-11 — Ordering and Comparing numbers

Q1 Maz must be the oldest, then Kat, then Jake, then Bina:



(2 marks for all correct, otherwise 1 mark for two correct)

Q2 415 > 4**0**6 *(1 mark)*
899 < **9**00 *(1 mark)*

Q3 The numbers are 115, 90, 901, 109 and 84. In order: **901, 115, 109, 90, 84**
(2 marks for all correct, otherwise 1 mark for largest and smallest correct)

Q4 The only amounts between 444 ml and 555 ml are: **499 ml** and **517 ml**
(2 marks for both circled and no others, otherwise 1 mark for one or both circled with at most one incorrect answer)

Q5 The heights in mm are roughly:
Top row: 55, 23, 60
Bottom row: 45, 30
In order from the shortest: 23, 30, 45, 55, 60
So the **30 mm mushroom on the bottom right** is the second shortest *(1 mark)*

Q6

2	Clementine	929
5	Rosie	870
3	Iman	901
6	Bakool	807
1	Eva	946
4	Stephen	898

(2 marks for all correct, otherwise 1 mark for getting numbers 2 and 6 correct)

Pages 12-13 — Partitioning

Q1 375 = 300 + 60 + 15
So he should buy **3** packs of 100, **2** packs of 30 and **3** packs of 5 *(2 marks for correct answer, otherwise 1 mark for another answer that gives a total of 375)*

Q2 795 = 700 + 60 + 30 + 5, so the remaining numbers in the sum are 100 + 40 + 4 = **144** *(1 mark)*
Adding together the hundreds, tens and ones separately gives:
800 + 130 + 9 = **939**
(1 mark)

Q3 E.g. 550 + 80 + 7
= 500 + 50 + 80 + 7
= 500 + 130 + 7 = 637 not 647 *(1 mark for suitable working, 1 mark for showing that the answers do not match)*

E.g. **550** + **90** + **7** = 647
(1 mark for one number correctly changed)

Q4 **£400** + **£80** + **£6** = £486
(1 mark)

£400 ÷ 2 = £200
£80 ÷ 2 = £40
£6 ÷ 2 = £3
£200 + £40 + £3 = **£243**
(1 mark)

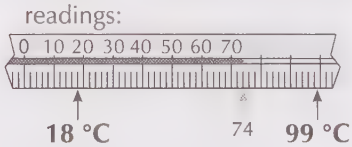
Q5 275 g = 200 g + 70 g + 5 g
200 g × 2 = 400 g
70 g × 2 = 140 g
5 g × 2 = 10 g
400 g + 140 g + 10 g = **550 g**
(1 mark for correct answer, 1 mark for suitable working using partitioning)

Q6 561 = 500 + 60 + 1
229 = 200 + 20 + 9
110 = 100 + 10
500 + 200 + 100 = 800
60 + 20 + 10 = 90
1 + 9 = 10
800 + 90 + 10 = 900
So Sammy moved **100 cm** on Thursday to get to 1000 cm *(2 marks for correct answer, otherwise 1 mark for suitable working using partitioning)*

Pages 14-15 — Numbers on Scales

Q1 On the left scale, the arrow is at 125 g. On the middle scale, the arrow is at 75 g. On the right scale, the arrow is at 70 g. The apple on the left weighs the most and the apple on the right weighs the least, so the order is **C, B, A** *(2 marks for all three correct, otherwise 1 mark for one correct)*

Q2 Each large interval is 10 °C, so each small interval is 2 °C. Count up to find the missing readings:



(1 mark for each)

Q3 The numbers are going down in steps of 100. Half a step is 100 ÷ 2 = 50. The arrow is pointing about halfway between 350 and 250, so it's about 350 – 50 = **300**
(1 mark — allow 280-320)

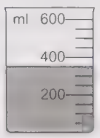
The numbers are going up in steps of 100. Half a step is 100 ÷ 2 = 50. The arrow is pointing about halfway between 120 and 220, so it's about 120 + 50 = **170**
(1 mark — allow 150-190)

Answers

Q4 On the white ruler, there are 10 intervals between 0 cm and 5 cm, so 1 interval is $5 \div 10 = 0.5$ cm. The leaf is 12 cm wide. On the grey ruler, there are 10 intervals between 0 cm and 20 cm, so each interval is $20 \div 10 = 2$ cm. $12 = 6 \times 2$, so the width of the leaf is 6 intervals above 0 cm:

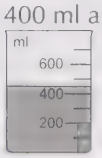
(2 marks for a correct arrow showing 12 cm, otherwise 1 mark for stating 12 cm as the width)

Q5 There are 10 intervals between 0 and 500 ml on the bottle, so each one is worth $500 \div 10 = 50$ ml, and so the water level is 350 ml. The beaker has 4 intervals between 0 and 200 ml, so each interval is worth $200 \div 4 = 50$ ml. Count up to 350 ml:



(1 mark)

The water level is halfway between 0 and 900 ml = 450 ml. The beaker has 2 intervals between 0 and 200 ml, so each interval is worth $200 \div 2 = 100$ ml. 450 ml is halfway between 400 ml and 500 ml:



(1 mark)

450 ml is more than 350 ml, so tick the **second beaker** *(1 mark)*

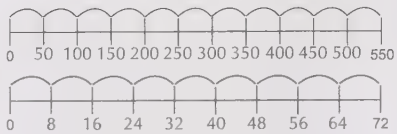
Pages 16-17 — Solving Number Problems

Q1 The number was between 450 and 540, so it could only have been **four hundred and fifty-five** (455) *(1 mark)*

Q2 $462 = 400 + 60 + 2$
$462 \div 2 = 200 + 30 + 1$
$= 231$ sweets.
$105 = 100 + 5$
$105 \times 2 = 200 + 10$
$= 210$ sweets.
210 sweets < 231 sweets
(1 mark for correct numbers, 1 mark for correct order)

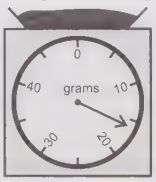
Q3 £999 – £300 = £699
£699 – £70 = **£629** *(1 mark)*

Q4 There are 11 hops of 50 cm between 0 and 550 cm, but only 9 hops of 8 cm between 0 and 72 cm:



(1 mark for 11 steps shown on top number line, 1 mark for 9 steps shown on bottom number line)

Q5 Count back 6 steps of 4 from 40: 36, 32, 28, 24, 20, 16. So there are 16 g left, which is just over halfway between 10 g and 20 g:



(2 marks for correct answer, otherwise 1 mark for 16 g written but marked incorrectly on the scale, or an incorrect amount written but this amount shown correctly on the scale)

Q6 $5 \times 50 = 250$
$2 \times 10 = 20$
$250 + 20 + 8$
$=$ **278 blue dice** *(1 mark)*

$278 = 200 + 60 + 18$, so she needs 2×100, 3×20 and 9×2. $2 + 3 + 9$
$=$ **14 packs of red dice**
(2 marks for correct answer, otherwise 1 mark for an answer that would give the same number of red dice as the number of blue dice calculated above)

Section Two — Calculations

Page 18 — Mental Addition

Q1 $212 + 8 =$ **220**
$231 + 90 =$ **321**
$267 + 60 =$ **327**
$228 + 9 =$ **237**
(1 mark for calculations correctly matched, 1 mark for missing answer)

Q2 $779 + 40 =$ **819** *(1 mark)*
$285 + 60 =$ **345** *(1 mark)*
$90 + 321 =$ **411** *(1 mark)*

Q3 $733 +$ **80** $= 813$ *(1 mark)*
8 $+ 919 = 927$ *(1 mark)*

Page 19 — Mental Subtraction

Q1 $754 - 60 = 694$
$937 - 200 = 737$
$740 - 6 = 734$
$799 - 70 = 729$
so **937 – 200** has the highest answer *(1 mark)*

Q2 $547 -$ **30** $= 517$ *(1 mark)*
$547 -$ **200** $= 347$ *(1 mark)*
$547 -$ **8** $= 539$ *(1 mark)*

Q3 $718 -$ **90** $= 628$ *(1 mark)*

Q4 E.g. $673 - 200 = 473$ pennies
$473 - 80 =$ **393 pennies**
(2 marks for correct answer, otherwise 1 mark for 473 or 593 pennies)

Page 20 — Written Addition

Q1
$$\begin{array}{r} 4\,6\,9 \\ +\,3\,8\,9 \\ \hline \mathbf{8\,5\,8} \\ 1\ 1 \end{array}$$
(1 mark)

Q2
$$\begin{array}{r} 3\,4\,\mathbf{6} \\ +\,1\,7\,8 \\ \hline 5\,\mathbf{2}\,4 \\ 1\ 1 \end{array} \qquad \begin{array}{r} 6\,\mathbf{7}\,7 \\ +\,\mathbf{2}\,8\,5 \\ \hline 9\,6\,2 \\ 1\ 1 \end{array}$$
(3 marks for all four correct digits, otherwise 2 marks for three correct digits or 1 mark for two correct digits)

Answers

Q3
$$\begin{array}{r} 6\,8\,0 \\ 2\,0\,9 \\ +\quad 7\,5 \\ \hline 9\,6\,4 \\ {\scriptstyle 1\ \ 1} \end{array}$$
(1 mark)

Page 21 — Written Subtraction

Q1
$$\begin{array}{r} {\scriptstyle 7\ 9\ 10\ 14} \\ \not{8}\ \not{0}\ \not{4} \\ -\,6\,9\,5 \\ \hline 1\,0\,9 \end{array}$$
(1 mark)

Q2 E.g.
$$\begin{array}{r} {\scriptstyle 7\ 14\ 15} \\ \not{8}\ \not{5}\ \not{5} \\ -\,3\,2\,7 \\ \hline 4\,2\,8 \end{array}$$
(1 mark for circling the exchange from the hundreds to the tens, and any other numbers in the hundreds column only)

$$\begin{array}{r} {\scriptstyle 4\ 15} \\ 8\ \not{5}\ \not{5} \\ -\,3\,2\,7 \\ \hline 5\,2\,8 \end{array}$$
(1 mark)

Q3
$$\begin{array}{r} {\scriptstyle 4\ 12\ 16} \\ \not{5}\ \not{3}\ \not{6} \\ -\,1\,9\,9 \\ \hline 3\,3\,7 \end{array}$$
(1 mark)

Page 22 — The 3, 4 and 8 Times Tables

Q1 $6 \times 4 = 24$
12 $\times 2 = 24$ *(1 mark)*

$4 \times 4 = 16$
$2 \times$ **8** $= 16$ *(1 mark)*

Q2 **2** groups of **16**, **4** groups of **8**, **8** groups of **4**, **16** groups of **2**
(1 mark for any two of these options)

Q3 **12** $= 3 \times 4$ and 4×3
36 $= 3 \times 12$ and 4×9
24 $= 3 \times 8$ and 4×6
(2 marks for all three correct answers and no others, otherwise 1 mark for at least two correct answers and no more than one other)

Q4 $7 \times 8 = 56$, $8 \times 8 = 64$,
so Depa gave out
56 glowsticks. $60 - 56$
$=$ **4 glowsticks**
(1 mark for correct answer, 1 mark for suitable working)

Pages 23-24 — Using Times Tables Facts

Q1 $72 \div 8 = 9$, $45 \div 9 = 5$,
so $72 \div 8 >$ **>** $45 \div 9$

$18 \div 3 = 6$, $60 \div 10 = 6$,
so $18 \div 3 =$ **=** $60 \div 10$

$35 \div 5 = 7$, $48 \div 8 = 6$,
so $35 \div 5 >$ **>** $48 \div 8$

$120 \div 12 = 10$, $36 \div 3 = 12$
so $120 \div 12 <$ **<** $36 \div 3$
(2 marks for all correct answers, otherwise 1 mark for three correct answers)

Q2 $270 \div 3 =$ **90**
$11 \times 20 =$ **220**
$320 \div 40 =$ **8**
$16 \times 6 = 8 \times 2 \times 6 =$ **96**
(1 mark for calculations correctly matched, 1 mark for missing answer)

Q3 E.g. $8 \times 8 = 64$
$640 = 64 \times 10 = 8 \times 80$
$640 \div 8 = 80$
(1 mark for suitable method)

Q4 $40 \div 5 = 8$, so $400 \div 50$
$=$ **8 lengths** *(1 mark)*

Q5 $31 + 31 = 62$ days
$62 \times 3 = 60 \times 3 + 2 \times 3$
$= 180 + 6 =$ **186 chews**
(1 mark)

Q6 E.g. $152 = 80 + 72$
$80 \div 8 = 10$, $72 \div 8 = 9$
So $152 \div 8 = 10 + 9 =$ **19**
(1 mark for correct answer, 1 mark for suitable working using partitioning)

Q7

×	7
80	560
2	**14**
	574

×	**9**
50	**450**
3	27
	477

(1 mark for each correctly filled grid)

Q8
$$\begin{array}{r} \mathbf{4\ 3} \\ 8\overline{)\,3\ 4^{2}4} \end{array} \qquad \begin{array}{r} 1\ \mathbf{9}\ 2 \\ 4\overline{)\,7^{3}6\ 8} \end{array}$$
(1 mark for each correct answer)

Q9
$$\begin{array}{r} 3\ 6 \\ 4\overline{)\,1\ 4^{2}4} \end{array} \qquad \begin{array}{r} 1\ 4\ 7 \\ 5\overline{)\,7^{2}3^{3}5} \end{array}$$
$4 \times$ **36** $= 144$ *(1 mark)*
$735 \div$ **147** $= 5$ *(1 mark)*

Page 25 — Estimating and Checking

Q1 **27 × 3** or **3 × 27** *(1 mark)*

Q2 $850 - 170 = 680$
$190 + 560 = 750$
$910 - 280 = 630$
$220 + 440 = 660$
660 is closest to 657, so the answer is **219 + 438** *(1 mark)*

Q3 E.g. 9×58 is about $10 \times 60 = 600$. 9 and 58 are both smaller than 10 and 60, so the answer should be less than 600. *(1 mark for a suitable explanation)*

Q4 **652 – 407** *(1 mark)*
16 × 8 or **8 × 16** *(1 mark)*
538 – 360 *(1 mark)*

Pages 26-27 — Solving Calculation Problems

Q1 There are 4 colours.
$24 \div 4 = 6$, so there are
6 crayons of each colour.
(1 mark)

Q2 450 g + 450 g = 900 g in total
$9 \div 3 = 3$,
so $900 \div 30 =$ **30 slices**
(1 mark for correct answer, 1 mark for suitable working)

Q3
$$4\overline{)\,7^{3}2}\ \ 1\ 8$$
So there are 18 groups.
$18 \times 3 = 10 \times 3 + 8 \times 3$
$= 30 + 24 =$ **54 members**
(1 mark for correct answer, 1 mark for suitable working)

Q4 £40 × 4 = £160
£5 × 4 = £20
£45 × 4 = £160 + £20
= £180
£180 – £45 = **£135**
(1 mark for correct answer, 1 mark for suitable working)

Q5 $48 \div 2 = 24$ apples
$20 \times 5 = 100$, $4 \times 5 = 20$
$24 \times 5 = 100 + 20$
$=$ **120 pips** *(1 mark)*

Answers

Q6 $3\overline{)216}$ → 72

$70 \times 2 = 140$, $2 \times 2 = 4$

$72 \times 2 = 140 + 4$

= **144 jelly beans** *(1 mark)*

Q7 **Sometimes true** —
$3 \times 4 = 12$, which is not a multiple of 8. $4 \times 4 = 16$, which is a multiple of 8.
(1 mark for answer with suitable explanation)

Q8 $\begin{array}{r} {}^{3}\not{4}\,{}^{1}8\ 7 \\ -\ 2\ 9\ 5 \\ \hline 1\ 9\ 2 \end{array}$

$8\overline{)1\ 9^{3}2}$ → 24

so she gets **24 blocks**
(1 mark for correct answer, 1 mark for suitable working)

Section Three — Fractions

Page 28 — Counting in Tenths

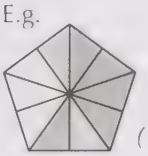
Q1 Each number is $\frac{3}{10}$ less than the previous number, so count back three tenths to get each fraction.

$1\frac{1}{10} - \frac{1}{10} = 1 = \frac{10}{10}$

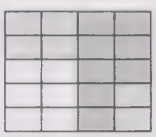
$\frac{10}{10} - \frac{2}{10} = \mathbf{\frac{8}{10}}$ *(1 mark)*

$\frac{8}{10} - \frac{3}{10} = \mathbf{\frac{5}{10}}$ *(1 mark)*

Q2 E.g.



(1 mark for any three parts left unshaded)



(1 mark for any six parts left unshaded)

Q3 Each interval is worth $\frac{2}{10}$.

(1 mark for each — allow $\frac{19}{10}$ and $\frac{24}{10}$)

Page 29 — Equivalent Fractions

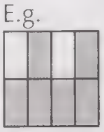
Q1 $\mathbf{\frac{4}{6}}$ is shaded *(1 mark)*

$\mathbf{\frac{4}{8}}$ is shaded *(1 mark)*

Q2 The second and third shapes have $\frac{3}{4}$ shaded. The first shape has $\frac{5}{8}$ shaded, so does not have an equal fraction shaded.

(1 mark)

E.g.



(1 mark for shape with eight equal parts and six shaded)

Q3 E.g.

(1 mark for three parts shaded in shape 1, 1 mark for six parts shaded in shape 2)

Pages 30-31 — Ordering Fractions

Q1 $\frac{1}{12}$ $\mathbf{\frac{1}{11}}$ $\frac{1}{10}$ $\mathbf{\frac{1}{9}}$ $\frac{1}{8}$ *(1 mark)*

Q2 In order from largest to smallest: $\frac{7}{8}$, $\frac{6}{8}$, $\frac{5}{8}$, ... so $\mathbf{\frac{5}{8}}$ is third largest *(1 mark)*

Q3 $\frac{1}{7} > \frac{1}{9}$, $\frac{1}{15} < \frac{5}{15}$, $\frac{12}{18} > \frac{2}{18}$, $\frac{1}{10} < \frac{1}{3}$
(2 marks for all correct answers, otherwise 1 mark for three correct answers)

Q4 E.g. **Preet's** cups will contain the largest amount as $\frac{1}{6}$ is larger than $\frac{1}{8}$ *(1 mark)*

Q5 $\frac{1}{9}$ is not shaded, so: $\mathbf{\frac{1}{8}}$, $\mathbf{\frac{3}{9}}$, $\mathbf{\frac{2}{9}}$ and $\mathbf{\frac{1}{6}}$ *(2 marks for all four correct and no others, otherwise 1 mark for at least two correct and no others)*

Q6 $\frac{8}{10}$ m $- \frac{2}{10}$ m $= \mathbf{\frac{6}{10}}$ **m**
(2 marks for correct answer, otherwise 1 mark for correct largest and smallest)

$\mathbf{\frac{3}{10}}$ **m** *(1 mark)*

Pages 32-33 — Adding and Subtracting Fractions

Q1 $\frac{1}{9} + \frac{3}{9} + \frac{4}{9} = \mathbf{\frac{8}{9}}$ *(1 mark)*

Q2 $\mathbf{\frac{8}{18}} + \frac{8}{18} = \frac{16}{18}$ *(1 mark)*

$\frac{17}{20} - \mathbf{\frac{9}{20}} = \frac{8}{20}$ *(1 mark)*

$\mathbf{\frac{6}{15}} - \frac{5}{15} < \frac{2}{15}$ *(1 mark)*

$\frac{2}{14} > \mathbf{\frac{9}{14}} - \frac{8}{14}$ *(1 mark)*

Q3 $\mathbf{\frac{11}{13}} - \mathbf{\frac{7}{13}} = \frac{4}{13}$ *(1 mark)*

Q4 $\frac{15}{17} - \frac{9}{17} = \frac{6}{17}$

$\frac{6}{17} + \frac{6}{17} = \mathbf{\frac{12}{17}}$ *(1 mark)*

Q5 $\mathbf{\frac{6}{24}} + \mathbf{\frac{7}{24}} + \mathbf{\frac{5}{24}} = \frac{18}{24}$
(1 mark)

Q6 $1 - \mathbf{\frac{3}{8}} = \frac{5}{8}$ *(1 mark)*

$\mathbf{\frac{6}{13}} + \mathbf{\frac{7}{13}} = 1$ *(1 mark)*

$1 - \mathbf{\frac{9}{23}} = \mathbf{\frac{14}{23}}$ *(1 mark)*

$\mathbf{\frac{25}{37}} + \mathbf{\frac{12}{37}} = 1$ *(1 mark)*

Q7 $\frac{13}{30} + \frac{8}{30} + \frac{3}{30} = \frac{24}{30}$

$1 - \frac{24}{30} = \mathbf{\frac{6}{30}}$ *(1 mark)*

Pages 34-35 — Fractions of Amounts

Q1 $\frac{1}{3}$ of $30 = 30 \div 3 = 10$

$\frac{5}{6}$ of 24: $24 \div 6 = 4$, $4 \times 5 = 20$

$\frac{2}{5}$ of 40: $40 \div 5 = 8$, $8 \times 2 = 16$

$\frac{1}{8}$ of $88 = 88 \div 8 = 11$

$\frac{3}{4}$ of 16: $16 \div 4 = 4$, $4 \times 3 = 12$

In order from largest to smallest: 20, 16, 12, 11, 10.

So $\mathbf{\frac{3}{4}}$ **of 16** is third largest *(1 mark)*

Answers

Q2 $\frac{1}{11}$ of 22 m = 22 ÷ 11 = 2 m
$\frac{2}{11}$ = 2 m × 2 = 4 m
22 m – 4 m = **18 m**
(1 mark for correct answer, 1 mark for suitable working)

Q3 E.g.

(1 mark for shading any other eight parts)

Q4 $\frac{1}{4}$ of 80p = 80 ÷ 4 = 20p
80p – 20p = 60p
$\frac{1}{3}$ of 60p = 60 ÷ 3 = 20p
60p – 20p = **40p**
(1 mark for correct answer, 1 mark for suitable working)

Q5 $1 - \frac{3}{5} = \frac{2}{5}$
$\frac{1}{5}$ of 35 = 35 ÷ 5 = 7 geese
$\frac{2}{5}$ of 35 = 7 × 2 = **14 geese**
(1 mark)

Q6 $\frac{1}{12}$ of £36 = £36 ÷ 12 = £3
$\frac{5}{12}$ of £36 = £3 × 5 = £15
$\frac{1}{9}$ of £36 = £36 ÷ 9 = £4
$\frac{4}{9}$ of £36 = £4 × 4 = £16
So $\frac{\mathbf{4}}{\mathbf{9}}$ of £36 gives the highest amount *(1 mark)*

E.g.

(1 mark for five rectangles / fifteen small squares shaded in grid 1 and four large squares / sixteen small squares shaded in grid 2)

Q7 $\frac{1}{5}$ of 60 = 60 ÷ 5 = 12 cars
$\frac{2}{5}$ of 60 = 12 × 2 = 24 cars
$\frac{1}{8}$ of 24 = 24 ÷ 8 = **3 cars**
(1 mark for correct answer, 1 mark for suitable working)

Pages 36-37 — Solving Fraction Problems

Q1 Glyn took $\frac{1}{2}$ of £48
= £48 ÷ 2 = £24
$\frac{1}{8}$ of £48 = £48 ÷ 8 = £6
$\frac{5}{8}$ of £48 = £6 × 5 = £30
$\frac{1}{4}$ of £24 = £24 ÷ 4 = £6
$\frac{3}{4}$ of £24 = £6 × 3 = £18
£30 – £18 = **£12**
(1 mark for correct answer, 1 mark for suitable working)

Q2 $\frac{4}{20}$ kg + $\frac{3}{20}$ kg + $\frac{8}{20}$ kg
= $\frac{15}{20}$ kg, so the fruits are **apple**, **banana** and **mango**.
(1 mark)

$\frac{8}{20}$ kg + $\frac{8}{20}$ kg = $\frac{16}{20}$ kg,
$\frac{8}{20}$ kg + $\frac{8}{20}$ kg + $\frac{8}{20}$ kg
> 1 kg
1 kg – $\frac{16}{20}$ kg = $\frac{4}{20}$ kg
$\frac{4}{20}$ kg =
$\frac{1}{20} + \frac{1}{20} + \frac{1}{20} + \frac{1}{20}$
= **4 limes**
(1 mark for correct answer, 1 mark for suitable working)

Q3 $\frac{1}{8}$ of 32 inches
= 32 inches ÷ 8 = 4 inches
$\frac{6}{8}$ of 32 inches
= 4 inches × 6 = 24 inches
$\frac{1}{8}$ of 24 inches
= 24 inches ÷ 8 = 3 inches
$\frac{6}{8}$ of 24 inches
= 3 inches × 6
= **18 inches** *(1 mark)*

Q4 $\frac{1}{12}$ of 96 g = 96 g ÷ 12 = 8 g
$\frac{2}{12}$ of 96 g = 8 g × 2 = 16 g
96 g – 16 g = 80 g
80 g – 16 g = **64 g**
(1 mark for correct answer, 1 mark for suitable working)

Q5 $\frac{1}{3}$ of 33 m = 33 m ÷ 3
= 11 m
$\frac{1}{11}$ of 33 m = 33 m ÷ 11
= 3 m
$\frac{4}{11}$ of 33 m = 3 m × 4
= 12 m
33 m – 11 m – 12 m = **10 m**
(1 mark for correct answer, 1 mark for suitable working)

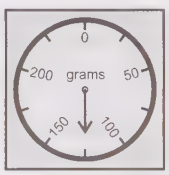
Q6 $\frac{1}{4}$ of 880 ml = 880 ml ÷ 4
= 220 ml
880 ml – 220 ml = 660 ml
660 ml ÷ 3 = **220 ml**
(1 mark for correct answer, 1 mark for suitable working)

Section Four — Measurement

Pages 38-39 — Length, Mass and Volume

Q1 1 cm = 10 mm,
so 30 cm = 300 mm
40 + 300 + 40 = **380 mm**
(1 mark)

Q2 1000 g = 1 kg,
so 4000 g = 4 kg
2 potatoes weigh
4 kg 250 g – 4 kg = 250 g,
so 1 potato weighs
250 ÷ 2 = 125 g



(1 mark)

Q3 $1 - \frac{3}{4} = \frac{1}{4}$ left
$\frac{1}{4}$ of 200 ml = 200 ÷ 4
= **50 ml** *(1 mark)*

Q4 1 m = 100 cm, so Aaron is
100 + 30 = 130 cm tall.
$\frac{1}{4}$ of 100 = 100 ÷ 4 = 25, so Chuni is 100 + 25 = 125 cm tall. 120 cm is less than 130 cm and 125 cm.
So **Bella** is the shortest.
(1 mark for correct answer, 1 mark for suitable working)

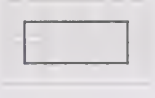
Answers

Q5 E.g. 400 g = 8 marbles, so 100 g = 8 ÷ 4 = 2 marbles. 1 kg = 1000 g, so 1 kg = 2 × 10 = **20 marbles**. *(1 mark for correct answer, 1 mark for suitable working)*

Q6 1 litre = 1000 ml, so $\frac{1}{2}$ litre = 500 ml. A = 1000 + 500 = 1500 ml. C = 1000 + 200 = 1200 ml. $\frac{1}{4}$ of 8 = 8 ÷ 4 = 2 litres, so D = 2000 ml. The order is **B, C, A, D** *(2 marks for the correct order, otherwise 1 mark for the smallest and largest correct)*

Pages 40-41 — Perimeter

Q1 Shape A has perimeter = 1 cm + 1 cm + 2 cm + 1 cm + 5 cm + 4 cm = 14 cm. So draw a rectangle with a **perimeter of 14 cm**, e.g.



(1 mark)

Q2 24 m – 8 m – 7 m = **9 m** *(1 mark)*

Q3 Perimeter of square = 30 mm + 30 mm + 30 mm + 30 mm = 120 mm. 1 cm = 10 mm, so perimeter of rectangle = 80 mm + 30 mm + 80 mm + 30 mm = 220 mm. Difference is 220 – 120 = **100 mm** *(1 mark for correct answer, 1 mark for suitable working)*

Q4 E.g. You can't add four lots of the same whole number to get 15 *(1 mark)*

Q5 E.g. 200 mm – 60 mm – 60 mm = 80 mm, so A + A must be less than 80 mm. 39 + 39 = 78, but 40 + 40 = 80, so the largest A can be is **39 mm**. *(1 mark for correct answer, 1 mark for suitable working)*

Q6 $\frac{1}{5}$ m + $\frac{1}{5}$ m = $\frac{2}{5}$ m, $\frac{2}{5}$ m + $\frac{1}{5}$ m = $\frac{\mathbf{3}}{\mathbf{5}}$ **m** *(1 mark for correct answer, 1 mark for suitable working)*

Page 42 — Money

Q1 The doughnut is the most expensive as it costs 105p. 105 + 105 + 105 = 315p = **£3.15** *(1 mark)*

He pays 4 × 50p = 200p, and gets 10p + 20p = 30p change, so the items cost 200p – 30p = 170p. He buys **two pies**, as 85p + 85p = 170p. *(1 mark for correct answer, 1 mark for suitable working)*

Q2 £4.25 = 425p, £2.50 = 250p, 425p – 250p = 175p = £1.75, which can be made with **£1**, **50p**, **20p**, **5p** *(1 mark for all four ticked and no others)*

Page 43 — Clocks

Q1 **6:12** *(1 mark)* **12:48** *(1 mark)*

Q2 **ten past nine pm** *(1 mark)* **half past ten pm** *(1 mark)*

Q3 1 minute = 60 seconds, so half a minute = 30 seconds. 60 × 10 = 600 seconds, 600 + 30 = **630 seconds** *(1 mark)*

There are 30 days in April. She cycles on $\frac{1}{10}$ of 30 = 30 ÷ 10 = **3 days** *(1 mark)*

Pages 44-45 — Time Problems

Q1 **5:10 pm** *(1 mark)*

Q2 20 minutes before 3:15 pm is 2:55 pm. 8:30 am + 6 hours = 2:30 pm. 2:30 pm + 25 minutes = 2:55 pm. So he is at the zoo for **6 hours 25 minutes** *(1 mark)*

Q3 Music is the same length as 9:00 am to 10:15 am = 1 hr 15 minutes. Science is 10 minutes shorter than 11:55 am to 1:00 pm = 1 hr 5 minutes – 10 minutes = 55 minutes. So, the final two rows in the table are:

Music	**1:55 pm**	**3:10 pm**
Science	**3:10 pm**	**4:05 pm**

(1 mark for each correct row)

Q4 21:02 – 1 hour = 20:02 20:02 – 2 minutes = 20:00 20:00 – 48 minutes = **19:12** *(1 mark)*

Q5 The last train he can catch is at 11:10 am. 11:10 am + 2 hours = 1:10 pm. 1:10 pm + 15 minutes = **1:25 pm** *(1 mark)*

Q6 Bethany finished at 4:10 pm + 5 minutes = 4:15 pm. 2:30 pm to 4:15 pm = 1 hour 45 minutes 1 hour 45 minutes + 15 minutes = 2 hours 2 hours + 1 hour 10 minutes = 3 hours 10 minutes 1 hour = 60 minutes So Bethany was quicker by 15 + 60 + 10 = **85 minutes**. *(1 mark for correct answer, 1 mark for suitable working)*

Section Five — Geometry

Pages 46-47 — 2D Shapes

Q1

(1 mark)

Q2 E.g. The shape might be a rectangle/oblong with not all sides being equal *(1 mark)*

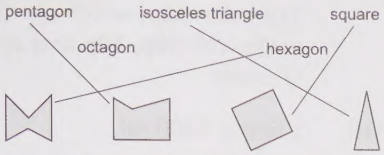
Q3 3 + 7 = 10 10 × 8 = **80** *(1 mark)*

Q4 The **isosceles triangle** doesn't have all sides equal *(1 mark)*

E.g. **equilateral triangle** *(1 mark for any regular shape except square)*

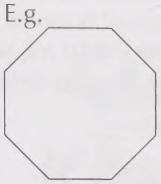
Answers

Q5



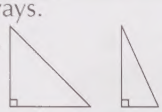
(1 mark for all lines correct)

E.g.



(1 mark for a shape with eight sides)

Q6 **Sometimes true** — two of the sides can be equal but aren't always.

E.g. 

(1 mark for suitable explanation with diagrams of right-angled triangles with and without two equal sides)

Pages 48-49 — 3D Shapes

Q1 A has 9 edges, B has 2 edges, C has 8 edges, D has 12 edges and E has 6 edges. So the order is **B**, **E**, **C**, **A**, **D**. *(2 marks for all in correct order, otherwise 1 mark for correct first and last)*

A, C and D have 5 or more vertices, so $\frac{3}{5}$ *(1 mark)*

Q2 Hexagonal prism needs 18 sticks and 12 balls of clay. Octagonal prism needs 24 sticks and 16 balls of clay. So an extra **6 sticks** *(1 mark)* **and 4 balls of clay** *(1 mark)* are needed.

Q3 A cone has 1 vertex. The shape is a cube or cuboid with 8 vertices, so will have 8 – 1 = **7 more vertices** *(1 mark)*

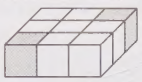
Q4

Has an **equal** number of vertices and faces	Has **more** vertices than faces
tetrahedron	**cube**
square-based pyramid	**pentagonal** or **hexagonal prism**

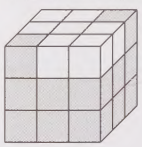
(2 marks for all correct answers, otherwise 1 mark for three correct answers)

The cube (6 faces), hexagonal prism (8 faces) and pentagonal prism (7 faces) are prisms. 6 + 7 = 13, so the answer is **cube** and **pentagonal prism** *(1 mark)*

Q5 Two cube blocks are needed to complete one layer as shown below:



Then two more layers like this (9 + 9 = 18 cube blocks) would make a larger cube:

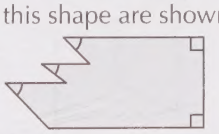


2 + 18 = **20 cube blocks** *(1 mark)*

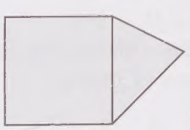
Pages 50-51 — Angles and Lines

Q1 20 right angles ÷ 4 = 5 full turns
5 × 10 cm = **50 cm** *(1 mark)*

Q2 The acute and right angles in this shape are shown below:



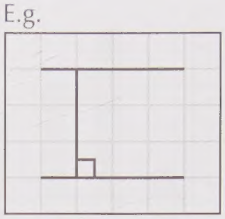
So there is **1** more acute angle than right angles. *(1 mark)*

Q3 

(1 mark)

Q4 **B** — it has 3 sets *(1 mark)*
C *(1 mark)*
B *(1 mark)*

Q5 E.g.



(1 mark for one vertical line and two horizontal lines)

Q6 **Right-angled triangle** *(1 mark)*

Section Six — Statistics

Page 52 — Tables

Q1 10 + 17 + 15 + 13 = 55
55 × 2 = **110 pupils** *(1 mark)*

Q2

Shape	Tally	Frequency
Triangle	𝍸 III	8
Square	𝍸 𝍸 II	**12**
Pentagon	IIII	4
Hexagon	𝍸 I	**6**

(1 mark for all correct)

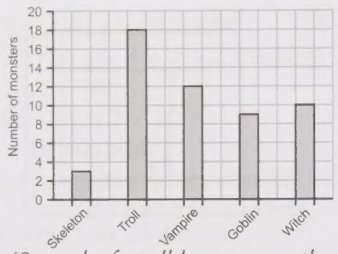
The 2 correct statements are:
'one third of the children drew a shape with more than 4 sides'
(30 ÷ 3 = 10 children and 6 + 4 = 10 children)
'the most popular shape was a square'
(square has the highest tally score of 12)
(2 marks for both correct statements ticked and no others, otherwise 1 mark for one or both correct statements ticked and at most one other)

Page 53 — Bar Charts

Q1 **Chart B** — e.g. because it's easier to read the exact number of animals.
(1 mark for correct answer with suitable explanation)

Answers

Q2



(2 marks for all bars correctly drawn, otherwise 1 mark for three bars correctly drawn)

Page 54 — Pictograms

Q1

(1 mark for each correct day)

$1\frac{1}{4}$ symbols = 8 + 2 = 10
$3\frac{1}{4}$ symbols = 3 × 8 + 2
= 24 + 2 = 26
26 – 10 = **16 flowers**
(1 mark)

50 flowers = 48 + 2
48 flowers ÷ 8 = 6 symbols
2 flowers = $\frac{1}{4}$ of a symbol
So 50 flowers = $\mathbf{6\frac{1}{4}}$ **symbols**
(1 mark)

Page 55 — Interpreting Tables and Charts

Q1 **Yes** *(1 mark)*

E.g. Each interval on the vertical axis is worth 5 minutes. The bar for Brian is one interval above 20 minutes, so is 25 minutes. The bar for Cassie is one interval above 50 minutes, so is 55 minutes.
55 minutes – 25 minutes = 30 minutes, which is half an hour. *(1 mark)*

Q2 There is $\frac{1}{2}$ a symbol less for Fastor than Zoom-E, so each symbol is worth 2 × 5 litres = 10 litres.
SP-33D needs 3 × 10 = **30 litres**.
(1 mark for correct answer, 1 mark for suitable working)

Pages 56-59 — Year Three Extension Test

Q1 400, **350**, 300, 250, **200**
(1 mark)

Q2 The tally chart shows 15 cherries and the bar chart shows 17 cherries, so circle the **cherry** bar. *(1 mark for cherry bar circled only)*

There are 7 apples and 14 bananas, so the sentence is: 'The number of **apples** is half the number of **bananas**.'
(1 mark)

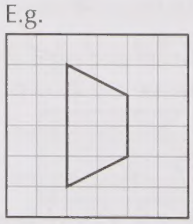
Q3 The number is between 490 and 509. 504 = **five hundred and four** is the only number in this range where the digits add up to 9 *(1 mark)*

Q4

(1 mark)

Q5 Multiples of 3:
3, 6, 9, 12, 15, 18, 21, 24, 27
Multiples of 4:
4, 8, 12, 16, 20, 24, 28
Multiples of 8: 8, 16, 24
The only number to appear in all three lists is **24** *(1 mark)*

Q6 E.g.



(1 mark)

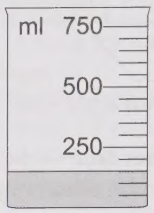
Q7 269 + 50 = 319
358 – 60 = 298
70 + 248 = 318
so **358 – 60** has the smallest answer *(1 mark)*

Q8 $\frac{1}{2} = \frac{5}{10}$, $\frac{3}{5} = \frac{6}{10}$, so the fractions smaller than $\frac{3}{10}$ are $\mathbf{\frac{2}{10}}$ and $\mathbf{\frac{3}{20}}$ *(1 mark)*

$\mathbf{\frac{3}{5}}$ and $\mathbf{\frac{6}{10}}$ *(1 mark for each)*

Q9 £2.00 – £1.69 = £0.31 = 31p
31p × 2 = 62p, which can be made with **50p**, **10p** and **2p**.
(1 mark)

Q10 1 litre = 1000 ml,
so $\frac{1}{2}$ litre = 500 ml.
500 ml – 350 ml = 150 ml.
Each interval is worth
250 ml ÷ 5 = 50 ml, so draw the water level as below:



(1 mark)

Q11

$$\begin{array}{r} 5\ 3\ \mathbf{8} \\ +\ 4\ \mathbf{3}\ 7 \\ \hline \mathbf{9}\ 7\ 5 \\ \hline 1 \end{array}$$

(2 marks for all correct digits, 1 mark for one correct digit)

Q12 3 × 100 = 300
6 × 10 = 60
300 + 60 = 360
36 ÷ 4 = 9, so 360 ÷ 40
= **9 packs** *(1 mark)*

Q13 $\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$
$1 - \frac{5}{7} = \mathbf{\frac{2}{7}}$ *(1 mark)*

28 g ÷ 7 = 4 g
4 g × 2 = **8 g** *(1 mark)*

Q14

$$\begin{array}{r} {}^{2}\cancel{3}^{1}\cancel{6}\cancel{\ }^{1}0\ \text{ml} \\ -\ 1\ 9\ 5\ \text{ml} \\ \hline 1\ 7\ 5\ \text{ml} \end{array}$$

175 = 100 + 70 + 5,
100 × 4 = 400, 70 × 4 = 280,
5 × 4 = 20, so 175 ml × 4
= 400 + 280 + 20 = **700 ml**
(1 mark for correct answer, 1 mark for suitable working)

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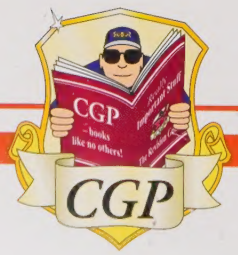

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