

# Sparx Maths

## Year 8 Term 1

Revision Workbook



# About this workbook

This workbook supports the revision of topics covered in **Year 8 Term 1** of the Sparx Maths Curriculum.

The workbook is divided into two sections:

- **Fluency questions** on each unit to practise the key concepts.
- **Mixed questions** on all topics to strengthen and deepen understanding.  
This section contains more challenging reasoning questions, cross-topic questions and problem solving questions.

If you use Sparx Maths you can find more questions and videos by searching for the following Sparx topic codes in Independent Learning.

Topic codes are also given with each question.

Units	Sparx topic codes				
Percentages of amounts	M437 M905				
Percentage change	M476 M533				
Calculating with money	M681				
Index laws	M608	M150	M120	M568	
Solving equations	M401	M902	M387	M554	M957
Term-to-term rules	M381 M241				
Position-to-term rules	M166 M991 M866				
Ratio	M885	M543	M267	M801	M525
Scale diagrams	M112				



Calculator questions are marked with this symbol



Non-calculator questions are marked with this symbol

## Percentages of amounts

**Q1**

M437



Work out 50% of 48

Answer: .....

**Q2**

M437



a) Work out 10% of 3000

Answer: .....

b) Work out 70% of 3000

Answer: .....

c) Work out 5% of 3000

Answer: .....

**Q3**

M437



a) Work out 1% of 4200

Answer: .....

b) Work out 10% of 4200

Answer: .....

c) Work out 11% of 4200

Answer: .....

**Q4**

M437



Work out 34% of 600

Answer: .....

**Q5**

M905

Work out 23% of 53



Answer: .....

**Q6**

M905

Work out 7% of 61



Answer: .....

**Q7**

M905

Work out 0.3% of £15 520



Answer: £ .....

**Q8**

M905

Work out 121% of 9.3 m



Answer: ..... m

**Q9**

M905

Thomas puts 16% of his monthly pay into a savings account.  
He is paid £935 in January.

How much should he put into his savings account?



Answer: £ .....

Q1

M476



What number is 20% **larger** than 700?

Answer: .....

Q2

M476



What number is 3% **smaller** than 1200?

Answer: .....

Q3

M476



The price of a hat is reduced by 15% in a sale.

What is the sale price of the hat?



Answer: £ .....

**Q4**

M533

**Increase 62 by 37%**



Answer: .....

**Q5**

M533

**Decrease £152 by 9%**



Answer: £ .....

**Q6**

M533

**Decrease 19 by 19.5%**



Answer: .....

**Q7**

M533

Roxanne currently earns £1650 per month.

If she receives an 8.5% pay **increase**, how much will she earn per month?



Answer: £ .....

**Q1**

M681



5 litres of tomato juice costs £6.75

a) How much does 1 litre of tomato juice cost?

Answer: £ .....

b) How much does 7 litres of tomato juice cost?

Answer: £ .....

c) How much does 10 litres of tomato juice cost?

Answer: £ .....

**Q2**

M681



The prices of bouncy balls sold in two different shops are shown below.

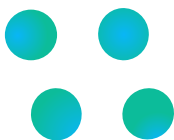
What is the cost of 24 bouncy balls at each shop?

**Toy shop**



**Bouncy balls  
£0.35 each**

**Supermarket**



**4 bouncy balls  
for £1.48**

Toy shop: £ .....

Supermarket: £ .....

**Q1**

M608



Work out the number that should go in the box.

$$32 \times 32 \times 32 \times 32 \times 32 \times 32 \times 32 = 32^{\boxed{\phantom{00}}}$$

**Q2**

M608



Work out the number that should go in the box.

$$15^7 \times 15^2 = 15^{\boxed{\phantom{00}}}$$

**Q3**

M150



Work out the number that should go in the box.

$$\frac{1}{8^7} = 8^{\boxed{\phantom{00}}}$$

**Q4**

M608



Work out the value of  $x$

$$\frac{12^8}{12^3} = 12^x$$

Answer:  $x =$  .....

**Q5**

M150



Work out the value of  $n$

$$4^7 \div 4^{-2} = 4^n$$

Answer:  $n =$  .....



**Q6**

M120



Simplify

a)  $h^1$

Answer: .....

b)  $h^0$

Answer: .....

**Q7**

M120



Simplify  $x^4 \times x \times x^3$

Answer: .....

**Q8**

M120



Simplify  $3m^5 \times 7m^2$

Answer: .....

**Q9**

M568



Simplify  $\frac{5kt^6}{15t^8}$

Answer: .....

**Q1**

M634

Solve  $4x - 3 = 21$



Answer:  $x =$  .....

**Q2**

M634

Solve  $58 = 3 + 5x$



Answer:  $x =$  .....

**Q3**

M647

M401

Solve

a)  $\frac{k}{2} + 4 = 18$



Answer:  $k =$  .....

b)  $\frac{k + 4}{2} = 18$

Answer:  $k =$  .....

**Q4**

M647

Solve  $15 = \frac{t}{2} - 11$



Answer:  $t =$  .....

**Q5**

M387

Solve  $\frac{24}{w} = 20$



Answer:  $w =$  .....

**Q6**

M387

Solve  $\frac{24}{3x} = 2$



Answer:  $x =$  .....

**Q7**

M387

Solve  $16 = 12 + \frac{48}{r}$



Answer:  $r =$  .....

**Q8**

M902

Solve  $5(h - 4) = 35$



Answer:  $h =$  .....

**Q9**

M902

Solve  $5(4 + 2m) = 27$



Answer:  $m =$  .....

**Q10**

M554

Solve  $12 + 3a = 7a$



Answer:  $a =$  .....

**Q11**

M554

Solve  $6d + 9 = 4d + 1$



Answer:  $d =$  .....

## Term-to-term rules

Q1

M381



The term-to-term rule for the sequence below is 'add 10'

Work out the next two terms in the sequence.



Q2

M381



Part of an arithmetic sequence is shown below.

Work out the first and fifth terms in the sequence.






Q3

M241



A sequence of patterns is made by adding the same number of dots each time.

Draw in the missing patterns of this sequence.

Pattern number	1	2	3	4	5	...
Pattern						...

**Q1**

M166



The  $n^{\text{th}}$  term rule of a sequence is  $8n + 4$

- a) Work out the first three terms of this sequence.

Answer: ....., ....., .....

- b) Work out the 17<sup>th</sup> term of this sequence.

Answer: .....

**Q2**

M991



The start of an arithmetic sequence is shown below.

What is the  $n^{\text{th}}$  term rule for this sequence?



Answer: .....

**Q3**

M991



The start of an arithmetic sequence is shown below.

What is the  $n^{\text{th}}$  term rule for this sequence?



Answer: .....




**Q4**

M866



A sequence of patterns is made by adding the same number of squares each time.

What is the expression for the number of squares in the  $n^{\text{th}}$  pattern?

Pattern number	1	2	3	...
Pattern				...

Answer: .....




**Q5**

M866



A sequence of patterns is made by adding the same number of dots each time.

What is the expression for the number of dots in the  $n^{\text{th}}$  pattern?

Pattern number	1	2	3	...
Pattern				...

Answer: .....

**Q1**

M885



A fruit bowl contains 3 bananas and 2 apples.

What is the ratio of bananas to apples?

Answer: .....

**Q2**

M885



a) Simplify the ratio 3 : 15

Answer: .....

b) Fully simplify the ratio 8 : 20

Answer: .....

**Q3**

M801



A jewellery box contains watches and rings in the ratio 1 : 3  
There are 12 rings in the jewellery box.

How many watches are there?

Answer: .....

**Q4**

M801



The ratio of T-shirts to jumpers in Rashid's wardrobe is 8 : 7  
There are 24 T-shirts in his wardrobe.

How many jumpers are there?

Answer: .....



Q5

M525



Angel and Ronnie share 54 beads in the ratio 5 : 4

How many beads does each person get?

Angel: .....

Ronnie: .....

Q6

M267



A pot of toy bricks contains yellow and red bricks in the ratio 2 : 3

a) What **fraction** of the bricks are **yellow**?

Answer: .....

b) What **percentage** of the bricks are **red**?

Answer: ..... %

Q7

M267



A drink is made from 24% pineapple juice, 16% pear juice and the rest is apple juice.

What is the ratio of pineapple to pear to apple juice in its simplest form?

Answer: .....

**Q8**

M543



Write 15 : 54 in the form 1 :  $n$

Answer: .....

**Q9**

M543



The ratio of red cars to black cars in a car park is 79 : 51

Write this ratio in the form  $n : 1$   
Give any decimals to 2 decimal places.

Answer: .....

**Q10**

M543



On a lake there are 23 swans, 86 ducks and 14 geese.

Write the ratio of swans to ducks to geese in the form 1 :  $m$  :  $n$   
Give any decimals to 2 decimal places.

Answer: .....

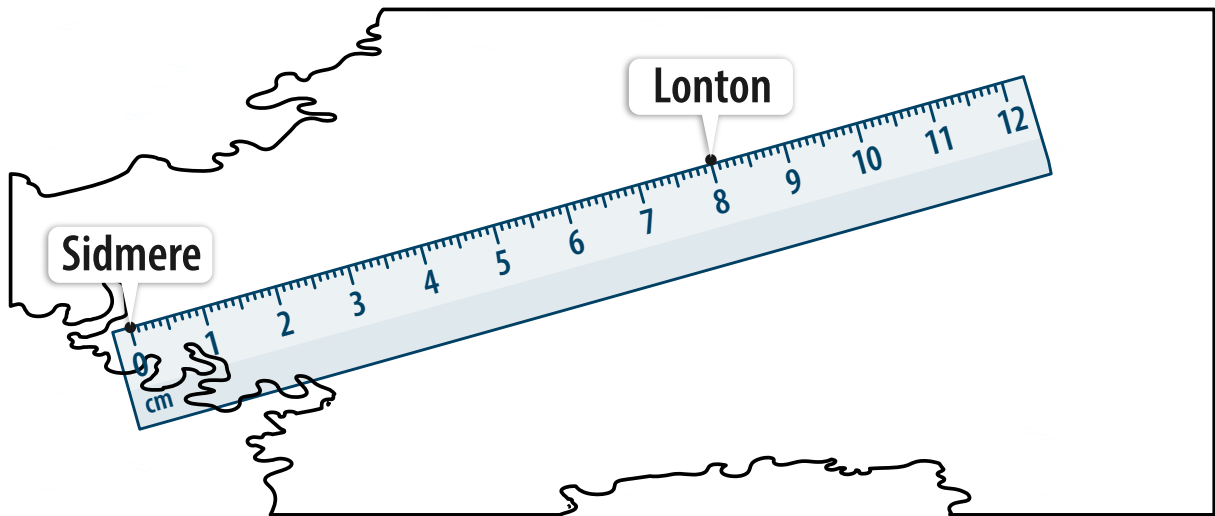
## Scale diagrams

**Q1**

M112



The scale on the map below is 1 cm represents 20 km.



- a) Work out the distance between Sidmere and Lonton.

Answer: ..... km

Dunham City is 50km from Sidmere and lies on a straight road from Sidmere to Lonton.

- b) Mark the position of Dunham City on the map above.

**Q2**

M112



On a scale diagram, a dog has a height of 2 cm.  
The real-life dog has a height 40 cm.

What is the scale of the diagram?  
Write your answer as a ratio in its simplest form.

Answer: .....



Q1

M608



$$2^{14} = 16\,384$$

Use this information to work out the value of  $2^{15}$

Answer: .....

Q2

M957



Caiden thinks of a number and calls his number  $m$   
He divides it by 4 then subtracts 3 and gets an answer of 18

Find the value of  $m$ .

Answer:  $m =$  .....

Q3

M150



Fill in the box to write  $8^{-2}$  as a fraction without any indices.

$$8^{-2} = \frac{1}{\boxed{\phantom{000}}}$$



Q4

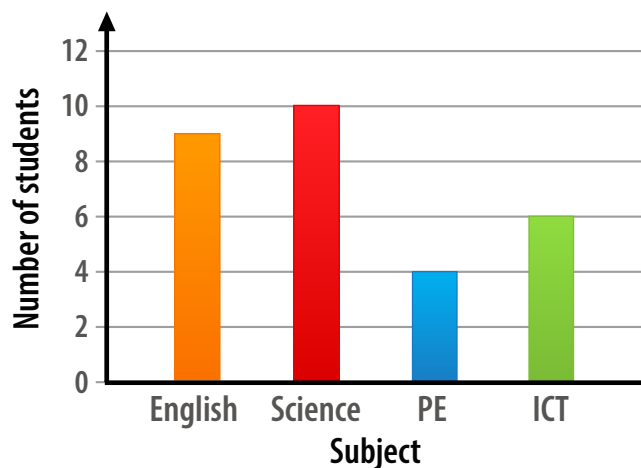
M885

M738



A group of students were asked what subject they prefer.

Write the ratio of the number of students who said English to the number of students who said ICT in its simplest form.



Answer: .....

Q5

M905



225 people were asked whether they can play a musical instrument.  
32% of people said that they can.

How many of the people asked can **not** play a musical instrument?

Answer: .....

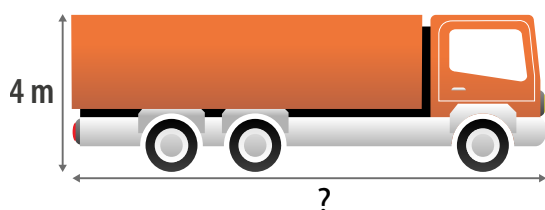
Q6

M112



The real height of the lorry is labelled on the scale diagram below.

Estimate the real length of the lorry.



Answer: ..... m



Q7

M381



A sequence is made by subtracting 70 each time.

400    330    260 ...

Work out the first two terms of the sequence which are **less than** zero.

Answer: .....

Q8

M267



In a bookshop 35% of the books are fantasy,  $\frac{1}{5}$  are horror and the rest are mystery.

What is the ratio of fantasy to horror to mystery books?  
Give your answer in its simplest form.

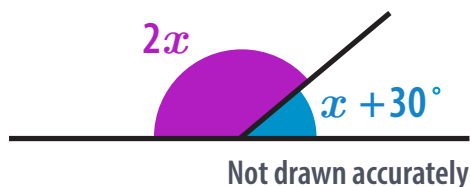
Answer: .....

Q9

M957



Work out the size of the larger marked angle.



Answer: .....  
o



Q10

M533



The price of a coat is reduced by 8.5% in a sale.  
The original price of the coat was £52.

Work out the sale price of the coat.



Answer: £ .....

Q11

M267



A bag contains only red and green counters in the ratio 7 : 8  
A counter is removed at random.

Work out the probability that it is green.  
Give your answer as a fraction.

Answer: .....

Q12

M681



A market stall sells photo frames for £4.25 each.  
A special offer means that if you buy 2 photo frames, you get another 1 for free.

How much would 24 photo frames cost?

Answer: £ .....



Q13

M608



- a) Work out the value of  $x$

$$\frac{17^x}{17^{15}} = 17^3$$

Answer:  $x =$  .....

- b) Work out the value of  $y$

$$\frac{18^{20}}{18^y} = 18^5$$

Answer:  $y =$  .....

Q14

M525



Nathan and Yusef share £120  
Yusef gets twice as much money as Nathan.

How much does Yusef get?

Answer: £ .....

Q15

M166



The  $n^{\text{th}}$  term rule for a sequence is  $\frac{n+3}{n^2}$

Work out the 6<sup>th</sup> term of this sequence as a fraction in its simplest form.

Answer: .....





Q16

M533

Increase £35 by 166%



Answer: £ .....

Q17

M509

The mean of the three cards below is 56

 $7h$  $11h$ 

42

Work out the value of  $h$ Answer:  $h =$  .....

Q18

M885

Some filmmakers recorded footage to make a documentary.

90 minutes of footage was used in the documentary.

3 hours of footage was unused.

What is the ratio of used to unused footage in its simplest form?

Answer: .....



Q19

M387

Solve  $\frac{28 + x}{x} = 3$



Answer:  $x =$  .....

Q20

M991

The  $n^{\text{th}}$  term rule for a sequence is  $9n + 1$   
73 is a term in this sequence.

What is the position of this term?



Answer: .....



Q21

M681



The prices of hiring a car from two different companies are shown below.

	Company A	Company B
Daily charge	£20	£40
Cost per mile	50p	30p

Lana wants to hire a car for 7 days to drive 900 miles.

She has a loyalty card with Company A that reduces the prices shown by  $\frac{1}{5}$

How much would it cost her to hire the car from the cheapest company?

Answer: £ .....

Q22

M112



The scale on a map is 1 : 2 000 000

The length of a path on the map is 3 cm.

What is the length, in **kilometres**, of the path in real life?

Answer: ..... km

**Q23**

M905



Alayna is paid £850 per month.  
Each month she spends 68% of her pay and saves the rest.

How many months will it take Alayna to save £4624?

Answer: ..... months

**Q24**

M387



Solve  $\frac{87}{x+3} = 10$

Answer:  $x =$  .....



**Q25**

M533



An elephant had a mass of 3000 kg

- a) After one month, its mass had increased by 2%  
What was the elephant's mass after one month?

Answer: ..... kg

- b) After two months, its **new** mass had increased by 5%  
What was the elephant's mass after two months?

Answer: ..... kg

**Q26**

M866



A sequence of patterns is made from square tiles with a side length of 1 cm  
A single square tile is added to the bottom of the pattern each time.

What is the perimeter of the  $n^{\text{th}}$  pattern?

Pattern number, $n$	1	2	3	...
Pattern				...

Answer: ..... cm



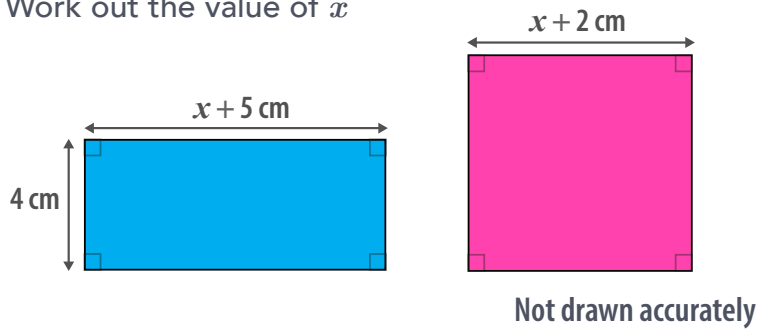
Q27

M957



The rectangle and the square below have the same perimeter.

Work out the value of  $x$



Answer:  $x =$  .....

Q28

M381



The term-to-term rule for the sequence below is 'add  $3x + 5$ '

Work out the two missing terms of the sequence.  
Give your answers as simply as possible.





Q29

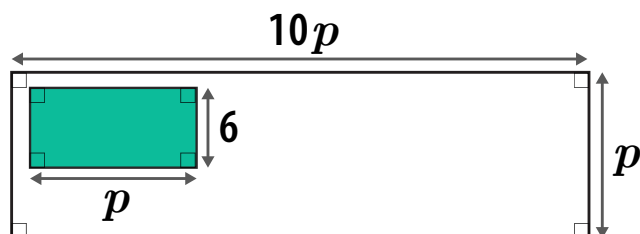
M568



The diagram below shows a rectangle that is partly shaded.

What fraction of the shape is shaded?

Give your answer as an algebraic fraction in its simplest form.



Not drawn accurately

Answer: .....

Q30

M543



The table below shows the numbers of pike and carp in three different lakes.

For each lake, work out the ratio of the number of pike to the number of carp in the form  $1 : n$

Put the lakes in ascending order based on the proportion of fish that are **carp**.

	Pike	Carp
Lake A	15	42
Lake B	9	30
Lake C	40	8

Answer: .....



Q31

M509



Use the equations below to work out the value of  $b$

$$\frac{2a + 4}{3} = 6$$

$$5b + 13 = a - 4$$

Answer:  $b =$  .....

Q32

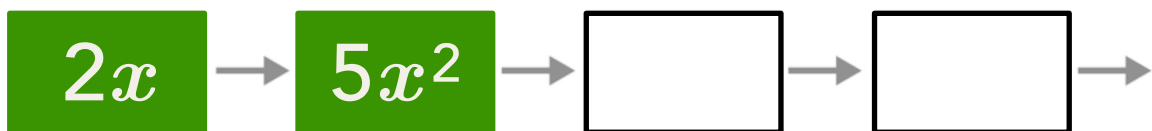
M381

M120



Each term in the sequence shown below is found by multiplying the previous two terms together.

Find the next two terms in the sequence.





## Percentages of amounts

**Q1** 24  
**Q2a** 300  
**Q2b** 2100  
**Q2c** 150  
**Q3a** 42  
**Q3b** 420  
**Q3c** 462  
**Q4** 204

**Q5** 12.19  
**Q6** 4.27  
**Q7** £46.56  
**Q8** 11.253 m  
**Q9** £149.60

## Percentage change

**Q1** 840  
**Q2** 1164  
**Q3** £10.54

**Q4** 84.94  
**Q5** £138.32  
**Q6** 15.295  
**Q7** £1790.25

## Calculating with money

**Q1a** £1.35  
**Q1b** £9.45  
**Q1c** £13.50  
**Q2** Toy shop: £8.40  
 Supermarket: £8.88

## Index laws

**Q1** 7  
**Q2** 9  
**Q3** -7  
**Q4**  $x = 5$   
**Q5**  $n = 9$

**Q6a**  $h$   
**Q6b** 1  
**Q7**  $x^8$   
**Q8**  $21m^7$   
**Q9**  $\frac{k}{3t^2}$


## Solving equations


**Q1**  $x = 6$   
**Q2**  $x = 11$   
**Q3a**  $k = 28$   
**Q3b**  $k = 32$

**Q4**  $t = 52$   
**Q5**  $w = 1.2$  or  $\frac{6}{5}$  or  $1\frac{1}{5}$   
**Q6**  $x = 4$   
**Q7**  $r = 12$



**Q8**  $h = 11$   
**Q9**  $m = 0.7$  or  $\frac{7}{10}$   
**Q10**  $a = 3$   
**Q11**  $d = -4$

## Term-to-term rules

**Q1** 

**Q2** 

**Q3**

1	5
	

## Position-to-term rules

**Q1a** 12, 20, 28

**Q1b** 140

**Q2**  $9n$

**Q3**  $3n - 2$

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**Q4**  $2n + 1$

**Q5**  $4n - 1$

## Ratio

**Q1** 3 : 2

**Q2a** 1 : 5

**Q2b** 2 : 5

**Q3** 4

**Q4** 21

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**Q5** Angel: 30  
Ronnie: 24

**Q6a**  $\frac{2}{5}$

**Q6b** 60%

**Q7** 6 : 4 : 15

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**Q8** 1 : 3.6

**Q9** 1.55 : 1

**Q10** 1 : 3.74 : 0.61

## Scale diagrams

**Q1a** 160 km

**Q1b** At the 2.5 cm mark on the ruler

**Q2** 1 : 20



## Mixed questions

**Q1** 32 768

**Q2**  $m = 84$

**Q3**  $8^{-2} = \frac{1}{64}$

**Q4** 3 : 2

**Q5** 153

**Q6** Any length between 10 m and 14 m

**Q7** -20, -90

**Q8** 7 : 4 : 9

**Q9**  $100^\circ$

**Q10** £47.58

**Q11**  $\frac{8}{15}$

**Q12** £68

**Q13a**  $x = 18$

**Q13b**  $y = 15$

**Q14** £80

**Q15**  $\frac{1}{4}$

**Q16** £93.10

**Q17**  $h = 7$

**Q18** 1 : 2

**Q19**  $x = 14$

**Q20** 8

**Q21** £472

**Q22** 60 km

**Q23** 17 months

**Q24**  $x = 5.7$

**Q25a** 3060 kg

**Q25b** 3213 kg

**Q26**  $2n + 8$  cm

**Q27**  $x = 5$

**Q28**  $x - 4 \rightarrow 4x + 1 \rightarrow 7x + 6 \rightarrow 10x + 11 \rightarrow$

**Q29**  $\frac{3}{5p}$

**Q30** Lake C, Lake A, Lake B

**Q31**  $b = -2$

**Q32**  $10x^3, 50x^5$



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