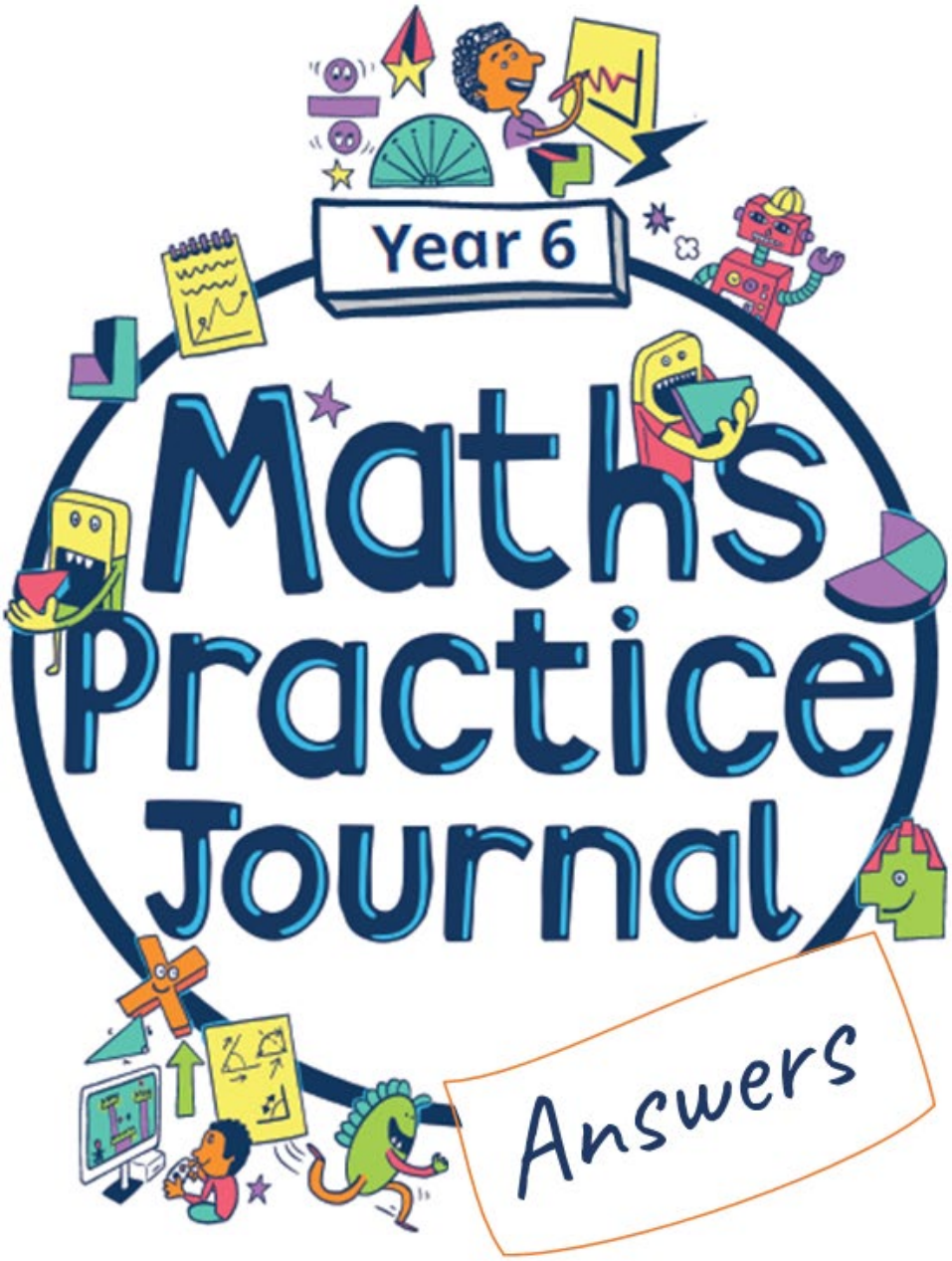
White Rose MATHS



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Year 6 Answers

Autumn term	Spring term	Summer term
Week 1	Week 1	Week 1
Week 2	Week 2	Week 2
Week 3	Week 3	Week 3
Week 4	Week 4	Week 4
Week 5	Week 5	Week 5
Week 6	Week 6	Week 6
Week 7	Week 7	Week 7
Week 8	Week 8	Week 8
Week 9	Week 9	Week 9
Week 10	Week 10	Week 10
Week 11	Week 11	Week 11
Week 12	Week 12	Week 12
Self-assessment	Self-assessment	Self-assessment

Autumn term Week 1

Let's remember

1 $20\ cm^3$

2 15 miles

3 −2

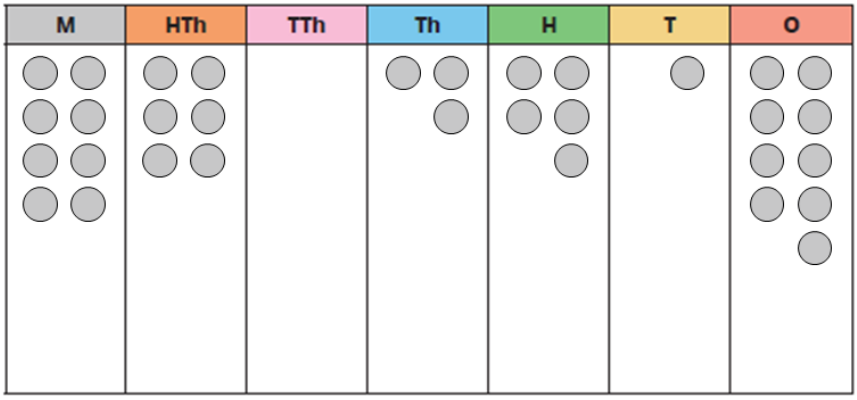
4 acute

Let's practise

1a 1,283,542

1b 3,201,624

2 8,603,519



3 One million, five hundred and twenty-three thousand, four hundred and sixteen

4 6,592,418

5a 1,041,312

5b 1,141,312

5c 1,021,312

5d 1,045,312

5e 41,312

Crack the code: order

Talk it out: Answers will vary.

Real world maths: Answers will vary.

Autumn term Week 2

Let's remember

1 8,750,000

2 5 cm^3

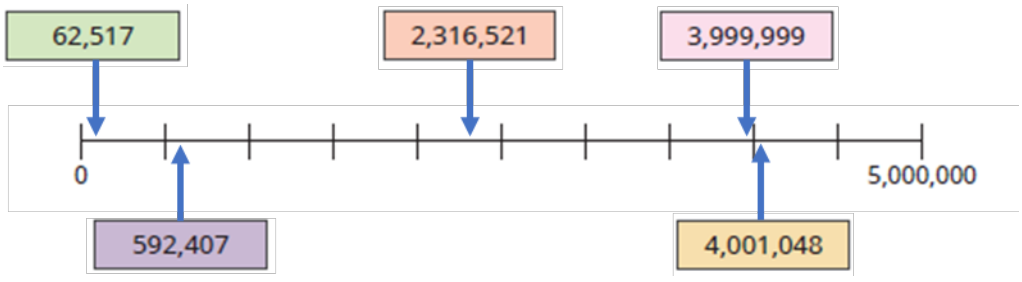
3 8 m = 8,000 mm

4 360 °

Let's practise

1 A = 2,000,000 B = 6,000,000 C = 8,000,000

2a

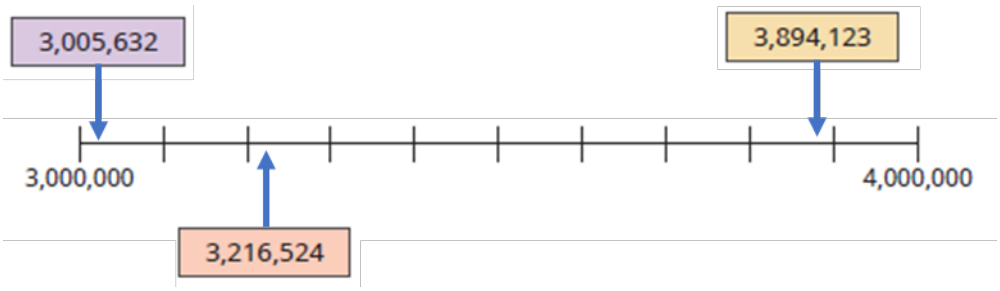


2b 4,001,048

2c 62,517

2d 62,517 592,407 2,316,521 3,999,999 4,001,048

3a



3b Rounded to the nearest 1,000,000:

3,216,524 = **3,000,000** 3,005,632 = **3,000,000**

3,894,123 = **4,000,000**

3c Rounded to the nearest 100,000:

3,216,524 = **3,200,000** 3,005,632 = **3,000,000**

3,894,123 = **3,900,000**

4 **−6** degrees Celsius

Crack the code: round

Real world maths: 146 degrees Celsius

Think it out:

Number	Rounded to the nearest					
	10	100	1,000	10,000	100,000	1,000,000
999,999	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000

They all round to 1,000,000

The same happens to 999,995 to the same degree of accuracy.

999,994 rounds to 999,990 to the nearest 10

1,010,101 rounds to 1,010,100 to the nearest 10 and 100; 1,010,000 to the nearest 1,000 and 10,000; and 1,000,000 to the nearest 100,000 and 1,000,000

Autumn term Week 3

Let's remember

1 124,000

2 600,000

3 9 minutes = **540** seconds

4 A triangular prism has **9** edges.

Let's practise

1a 4,621 + 5,137 = **9,758**

	4	6	2	1	
+	5	1	3	7	
	9	**7**	**5**	**8**	

1c 7,892 – 5,130 = **2,762**

	7	8	9	2	
–	5	1	3	0	
	2	**7**	**6**	**2**	

1b 3,209,187 + 97,243 = **3,306,430**

	3	2	0	9	1	8	7	
+			9	7	2	4	3	
	3	**3**	**0**	**6**	**4**	**3**	**0**	
		1	1		1	1		

1d 6,238,571 – 15,385 = **6,223,186**

	6	2	3	8	$^{4}\not{5}$	$^{16}\not{7}$	$^{1}1$	
–			1	5	3	8	5	
	6	**2**	**2**	**3**	**1**	**8**	**6**	

2a 6 and 9: **1, 3**

2b 32 and 12: **1, 2, 4**

2c 18 and 20: **1, 2**

2d 16 and 24: **1, 2, 4, 8**

3a 4 and 6: **12, 24, 36**

3b 5 and 3: **15, 30, 45**

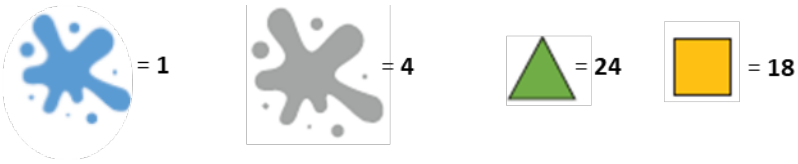
3c 8 and 12: **24, 48, 72**

3d 9 and 6: **18, 36, 54**

4 The common multiples of 6 and 12 are in the 12 times table: 12, 24, 36, 48, 60, 72, 84 and so on. All of the multiples of 12 are multiples of 6

5 The difference between the longest and the shortest side of the triangle is **6,204 mm**

Crack the code: multiples

Think it out: 

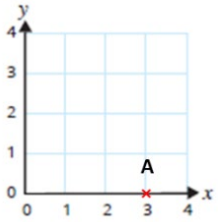
Autumn term Week 4

Let's remember

1 12,572 + 4,098 = **16,670**

2 3 – 8 = **–5**

3 8 cm^3

4 

Let's practise

1a Divisible by 2:

920 | 3,400 | 6,000 | 118,764

1b Divisible by 5:

85 | 920 | 2,195 | 3,400 | 6,000 | 32,595

1c Divisible by 10:

920 | 3,400 | 6,000

1d Answers may vary, for example, I looked at the last digit. If it is even, it is divisible by 2. If it is a 5 or 0 it is divisible by 5, and if it is 0 it is divisible by 10

2a $4^2 = 4 \times 4 =$ **16**

2b $9^2 = 9 \times 9 =$ **81**

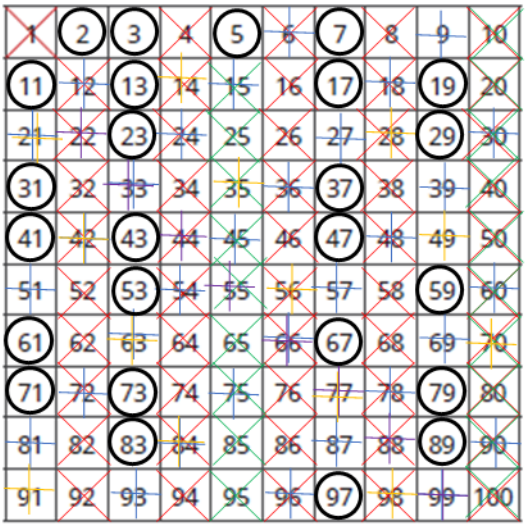
2c $3^3 = 3 \times 3 \times 3 =$ **27**

2d $5^3 = 5 \times 5 \times 5 =$ **125**

2e $8^2 + 1^3 =$ **65**

2f **28** $= 6^2 - 2^3$

3



The circled numbers are prime numbers and only have two factors, 1 and itself.

4a

4b

I know because even numbers that are divisible by 3 are also divisible by 6

Crack the code: whole

Think it out:

I will look at the triangle first. 2^3 = **8**

The circle is 8^2 = **64**

The pentagon is 64^2 = **4,096**

Talk it out: Answers will vary, for example, I know that a number is divisible by 3 if the sum of its digits is a multiple of 3. I can prove that the rule works by dividing my chosen number by 3:

1,234 = 1 + 2 + 3 + 4 = 10 10 is not a multiple of 3, so the number 1,234 is not divisible by 3

9,321 = 9 + 3 + 2 + 1 = 15 15 is a multiple of 3 so the number 9,321 is divisible by 3

9,321 ÷ 3 = 3,107

Autumn term Week 5

Let's remember

1 23 and 29

2 1, 5

3 7,000

4 (14, 3)

Let's practise

1a 204 × 12 = **2,448**

		2	0	4	
×			1	2	
		4	0	8	
	2	0	4	0	
	2	**4**	**4**	**8**	

1b 5,893 × 87 = **512,691**

			5	8	9	3	
×					8	7	
		4	1	2	5	1	
	4	7	1	4	4	0	
	5	**1**	**2**	**6**	**9**	**1**	
	1						

1c 2,018 × 43 = **86,774**

		2	0	1	8	
×				4	3	
		6	0	5	4	
	8	0	7	2	0	
	8	**6**	**7**	**7**	**4**	

1d 72 × 3,407 = **245,304**

					7	2	
×			3	4	0	7	
			6	8	1	4	
	2	3	8	4	9	0	
	2	**4**	**5**	**3**	**0**	**4**	
		1	1	1			

2a 6,903 ÷ 3 = **2,301**

		2	**3**	**0**	**1**
	3	6	9	0	3

2b 3,584 ÷ 7 = **512**

			5	**1**	**2**
	7	3	5	8	4

3a 1, 2, 3, 4, 6, 8, 12, 24

3b 1,392 ÷ 1 ÷ 24 1,392 ÷ 3 ÷ 8

1,392 ÷ 12 ÷ 2 1,392 ÷ 4 ÷ 6

3c 1,392 ÷ 24 = **58**

4a 948 ÷ 12 = **79**

4b 720 ÷ 15 = **48**

4c 396 ÷ 18 = **22**

4d **270** = 5,400 ÷ 20

4e **60** = 2,100 ÷ 35

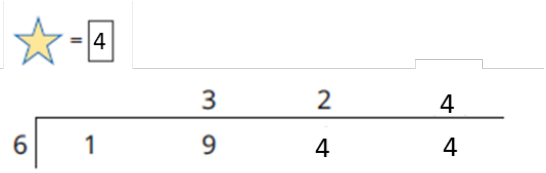
4f 36,900 ÷ 300 = **123**

5 29,550 g

6 £527

Crack the code: factors

Think it out:



Talk it out:

The strategy Tiny has tried to use is finding factors of the divisor to divide.

Tiny should have divided 6,970 by 10 but instead divided 13, 940

The correct answer is **697**

Autumn term Week 6

Let's remember

1 397 × 28 = **11,116**

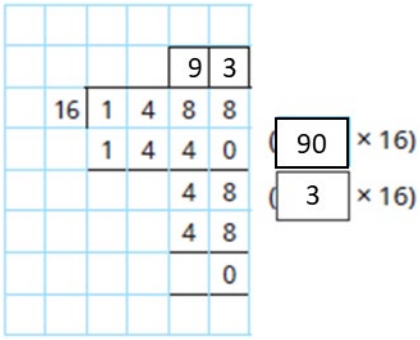
2 7^3 = **343**

3 120,000

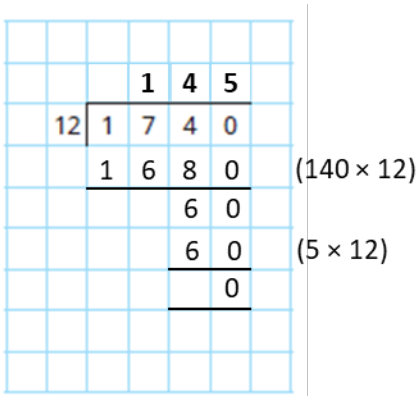
4 0.82 + **0.18** = 1

Let's practise

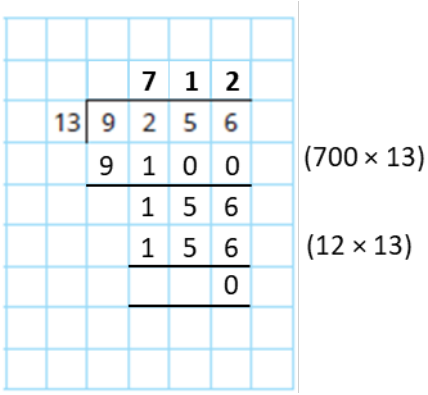
1



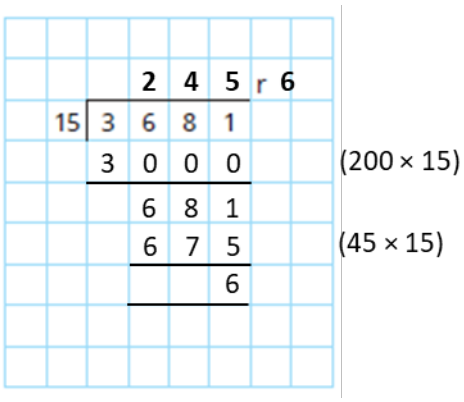
2a



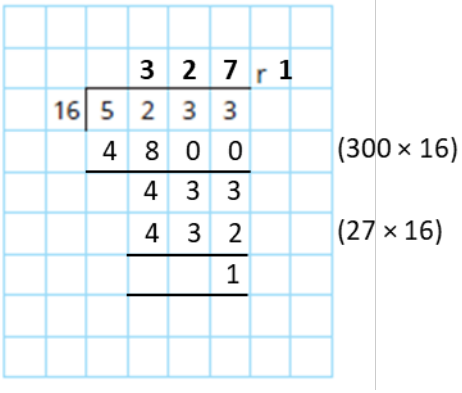
2b



3a



3b



4a Tiny must be wrong because the remainder can't be greater than 13

4b 1,783 ÷ 14 = **127 remainder 5**

5 **27** minibuses are needed.

No, they will not all be full; one will have 16 spare seats.

6 There are **83** completely full boxes.

Crack the code: inverse

Think it out: Answer will vary.

Talk it out:

There are 33 full boxes of apples and 42 full boxes of bananas.

There are 9 more full boxes of bananas than apples.

Ron needs 16 more apples to have another full box of apples and 17 bananas to have another full box of bananas.

First, I needed to work out how many full boxes there are of apples and bananas. Then, I needed to work out how many apples and bananas are left over. Then, I could work out how many more apples and bananas are needed to fill the boxes.

Autumn term Week 7

Let's remember

1 13,488 ÷ 24 = **562**

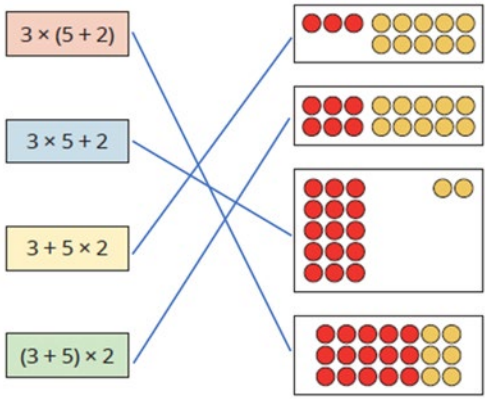
2 16 × 24 = 12 × **32**

3 The first common multiple of 8 and 12 is **24**

4 0.274 – 0.018 = **0.256**

Let's practise

1



2a 16 + 4 × 7 = **44**

2b 135 – 48 ÷ 8 = **129**

2c 132 – 5 × 9 = **87**

2d 125 × 1 – 9 × 7 = **62**

2e 147 + 3 × 50 = **297**

2f 212 × 19 – 212 × 9 = **2,120**

3a 42 + 93 = **135**

3b £10 – £3.32 = **£6.68**

3c 5 × 82 ml = **410 ml**

3d 582 g + 407 g = **989 g**

3e 15 × 9 = **135**

3f 5,860 mm – 999 mm = **4,861 mm**

4a 527 + 392 = **900**

4b 697 + 21 = **700**

4c 2,450 – 729 = **1,700**

4d 12,763 – 197 = **12,600**

5a **(**3 + 5**)** × 2 = 16

5b 28 ÷ **(**4 + 3**)** = 4

5c 6 × **(**3 + 4**)** × 2 = 84

5d 100 ÷ 4 + 6 × **(**2 + 7**)** = 79

6 30 shapes of which 12 are pentagons. 30 – 12 = 18 octagons and hexagons.

Jack has drawn twice as many octagons as hexagons, so he has drawn 12 octagons and 6 hexagons.

Sides: pentagons: 12 × 5 = 60; octagons: 12 × 8 = 96; hexagons: 6 × 6 = 36

60 + 96 + 36 = **192 sides**

Crack the code: calculate

Talk it out: Eva needs to do addition and subtraction in the order they are in the calculation so she needs to subtract 5 from 9 first and then add 4.

The answer is 8

Think it out: Answers will vary.

Autumn term Week 8

Let's remember

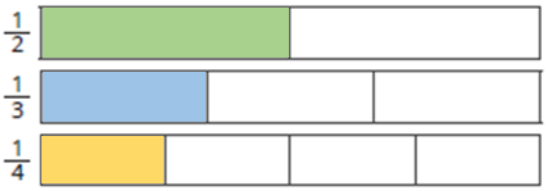
1 $5 + 6 \times 2 =$ **17**

2 $3{,}815 \div 8 =$ **476** remainder **7**

3 $19^2 =$ **361**

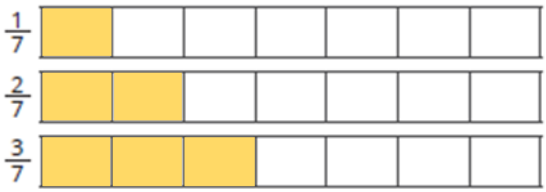
4 $32 \div 1{,}000 =$ **0.032**

Let's practise

1a 

1b $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$

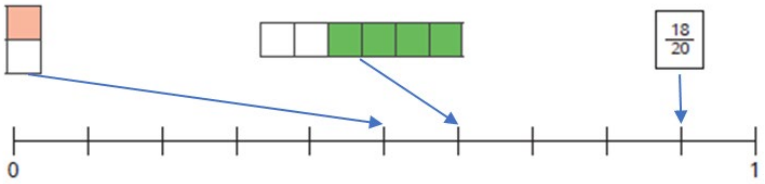
1c When the numerators are the same, the **greater** the denominator, the **smaller** the fraction (or when the numerators are the same, the **smaller** the denominator, the **greater** the fraction).

2a 

2b $\frac{3}{7}, \frac{2}{7}, \frac{1}{7}$

2c When the denominators are the same, the **greater** the numerator, the **greater** the fraction (or when the denominators are the same, the **smaller** the numerator, the **smaller** the fraction).

3



4a $\frac{6}{10} = \frac{3}{5}$

4b $\frac{7}{14} = \frac{1}{2}$

4c $\frac{28}{35} = \frac{4}{5}$

4d $\frac{12}{18} = \frac{2}{3}$

4e $\frac{88}{100} = \frac{22}{25}$

4f $\frac{560}{1000} = \frac{14}{25}$

5a $\frac{2}{5} + \frac{3}{10} = \frac{7}{10}$

5b $\frac{5}{8} - \frac{1}{4} = \frac{3}{8}$

5c $\frac{5}{6} - \frac{1}{48} = \frac{13}{16}$

5d $\frac{1}{3} + \frac{4}{9} = \frac{7}{9}$

5e $\frac{7}{10} - \frac{3}{10} = \frac{2}{5}$

5f $\frac{23}{100} + \frac{17}{25} = \frac{91}{100}$

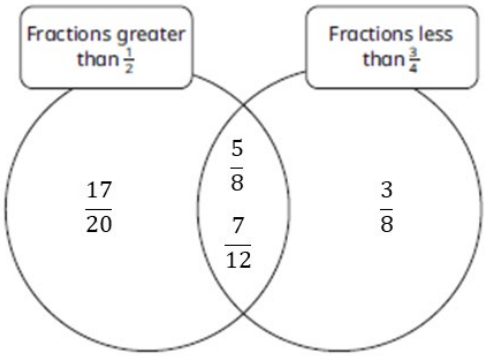
6 No. $6\frac{2}{4}$ is equivalent to $6\frac{1}{2}$, not $3\frac{1}{2}$. Tiny divided 6 by 2 rather than simplify the fraction.

Crack the code: fraction

Think it out: Shaded = $\frac{5}{12}$ Unshaded = $\frac{7}{12}$

Talk it out:

Explanations will vary.



Autumn term Week 9

Let's remember

1 $\frac{3}{4}$

2 19 × 24 = **456**

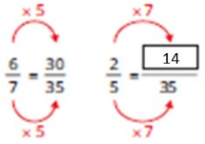
3 2,315 × 32 = **74,080**

4 3

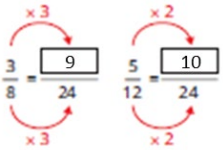
Let's practise

1a $\frac{2}{9}+\frac{4}{7}=\frac{14}{63}+\frac{36}{63}=\mathbf{\frac{50}{63}}$

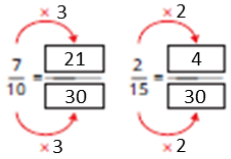
1b $\frac{6}{7}-\frac{2}{5}=\frac{30}{35}-\mathbf{\frac{14}{35}}=\mathbf{\frac{16}{35}}$



1c $\frac{3}{8}+\frac{5}{12}=\mathbf{\frac{9}{24}}+\mathbf{\frac{10}{24}}=\mathbf{\frac{19}{24}}$



1d $\frac{7}{10}-\frac{2}{15}=\mathbf{\frac{21}{30}}-\mathbf{\frac{4}{30}}=\mathbf{\frac{17}{30}}$



2a $\frac{3}{5}+\frac{1}{4}=\frac{17}{20}$

2b $\frac{3}{20}+\frac{7}{15}=\frac{37}{60}$

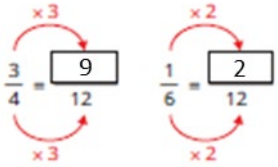
2c $\frac{5}{6}-\frac{1}{3}=\frac{1}{2}$

2d $\frac{5}{6}-\frac{1}{4}+\frac{2}{7}=\frac{73}{84}$

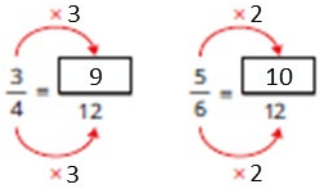
3a $3\frac{2}{5}+1\frac{1}{3}=3\frac{6}{15}+1\frac{5}{15}=\mathbf{4\frac{11}{15}}$

3b $3\frac{4}{5}+1\frac{1}{3}=3\frac{12}{15}+1\frac{5}{15}=4\frac{17}{15}=\mathbf{5\frac{2}{15}}$

3c $7\frac{3}{4}-2\frac{1}{6}=7\frac{\mathbf{9}}{12}-2\frac{\mathbf{2}}{12}=\mathbf{5\frac{7}{12}}$



3d $7\frac{3}{4}-2\frac{5}{6}=7\frac{\mathbf{9}}{12}-2\frac{\mathbf{10}}{12}=\mathbf{4\frac{11}{12}}$



4a $2\frac{1}{3}+3\frac{1}{6}=\mathbf{5\frac{1}{2}}$

4b $5\frac{3}{4}-3\frac{1}{2}=\mathbf{2\frac{1}{4}}$

4c $8\frac{1}{5}-3\frac{3}{4}=\mathbf{4\frac{9}{20}}$

4d $5\frac{7}{10}+2\frac{3}{5}-1\frac{1}{2}=\mathbf{6\frac{4}{5}}$

5 A to D = $10\frac{19}{60}$ m

Crack the code: denominator

Talk it out:

I don't agree with Tiny because when you subtract fractions the denominators must be the same first. Tiny needed to convert both fractional parts of the mixed numbers so that they had common denominators, then subtract the numerators. Because the fractional part of the first mixed number is smaller than the fractional part of the second mixed number, Tiny needed to convert both mixed numbers to improper fractions. $5\frac{3}{7}-2\frac{3}{5}=5\frac{15}{35}-2\frac{21}{35}=\frac{190}{35}-\frac{91}{35}=\frac{99}{35}$

Then convert back to a mixed number. $\frac{99}{35}=\mathbf{2\frac{29}{35}}$

Think it out: $2\frac{1}{2}+2\frac{1}{2}+1\frac{1}{4}=\mathbf{6\frac{1}{4}}$ **kg**

Autumn term Week 10

Let's remember

1 $\frac{3}{5} - \frac{2}{7} = \mathbf{\frac{11}{35}}$

2 $\frac{6}{7}$

3 532 ÷ **133** = 4

4 2.4 l = **2,400 ml**

Let's practise

1a $3 \times \frac{1}{4} = \mathbf{\frac{3}{4}}$

1b $2 \times \frac{3}{7} = \mathbf{\frac{6}{7}}$

1c $4 \times \frac{3}{10} = \mathbf{1\frac{1}{5}}$

1d $5 \times \frac{7}{15} = \mathbf{2\frac{1}{3}}$

2a $\frac{1}{2} \times \frac{1}{2} = \mathbf{\frac{1}{4}}$

2b $\frac{4}{5} \times \frac{2}{3} = \mathbf{\frac{8}{15}}$

2c $\frac{2}{3} \times \frac{1}{2} = \mathbf{\frac{1}{3}}$

2d $\frac{3}{8} \times \frac{5}{6} = \mathbf{\frac{5}{16}}$

3a $\frac{4}{7} \div 4 = \mathbf{\frac{1}{7}}$

3b $\frac{4}{7} \div 2 = \mathbf{\frac{2}{7}}$

3c $\frac{9}{10} \div 3 = \mathbf{\frac{3}{10}}$

3d $\frac{10}{13} \div 5 = \mathbf{\frac{2}{13}}$

4a $\frac{1}{20}$

4b $\frac{1}{20}$

5a $\frac{1}{18}$

5b $\frac{1}{18}$

6 $6\frac{3}{4}\text{ m}^2$

Crack the code: numerator

Think it out:

$5 \times \frac{2}{3} = 10 \times \frac{1}{3}$

$10 \times \frac{3}{8} = 6 \times \frac{5}{8}$

$5 \times \frac{1}{4} = 10 \times \frac{1}{8}$

Talk it out: Answers will vary, for example,

When you add two fractions, you need to make sure that the denominators are the same. If they are different, you need to change the fractions so they have the same denominator. Then you can add the numerators. Simplify the fraction if you need to.

When you multiply two fractions, you multiply the numerators together and then the denominators together. Simplify the fraction if you need to.

Autumn term Week 11

Let's remember

1 $\frac{1}{5} \times \frac{2}{3} = \mathbf{\frac{2}{15}}$

2 $4\frac{2}{5} + 7\frac{1}{3} + 1\frac{3}{5} = \mathbf{13\frac{1}{3}}$

3 3 × 9 + 12 ÷ 4 = **30**

4 1 week = **168** hours

Let's practise

1a $3\frac{2}{5} + 1\frac{1}{3} = \mathbf{4\frac{11}{15}}$

1b $\frac{4}{11} \div 2 = \mathbf{\frac{2}{11}}$

1c $3\frac{1}{2} - 1\frac{1}{6} = \mathbf{2\frac{1}{3}}$

1d $\frac{2}{7} \times \frac{3}{8} = \mathbf{\frac{3}{28}}$

1e $2\frac{1}{5} - \frac{17}{20} = \mathbf{1\frac{7}{20}}$

1f $(\frac{3}{5} - \frac{1}{10}) \div 7 = \mathbf{\frac{1}{14}}$

2a $\frac{1}{5}$ of 60 = **12**

2b $\frac{4}{5}$ of 60 = **48**

2c $\frac{3}{4}$ of 72 = **54**

2d $\frac{4}{7}$ of 56 = **32**

3a $\frac{1}{5}$ of **300** = 60

3b $\frac{4}{5}$ of **75** = 60

3c $\frac{3}{4}$ of **96** = 72

3d $\frac{4}{7}$ of **98** = 56

4 Perimeter = $\mathbf{16\frac{1}{3}}$ **m**

5 432

Crack the code: compare

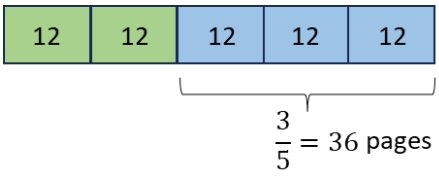
Real world maths: The book is **86** pages long.

Monday = 26 pages

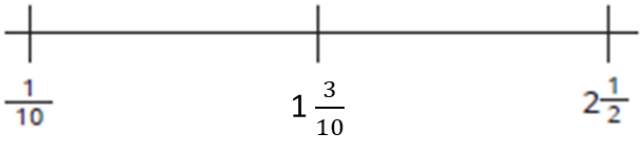
Tuesday = $\frac{2}{5}$ of the remaining pages

Wednesday = 36 pages = $\frac{3}{5}$

26 + 24 + 36 = 86 pages



Think it out:



Autumn term Week 12

Let's remember

1 $\frac{6}{7}$ of 84 = **72**

2 $\frac{8}{9} \div 4 = \mathbf{\frac{2}{9}}$

3 $\frac{1}{20}, \frac{1}{10}, \frac{1}{8}, \frac{1}{4}, \frac{1}{2}$

4 B

Let's practise

1a 7 kg = **7,000 g**

1b 3,000 ml = **3 l**

1c 6 tonnes = **6,156 kg**

1d **270 mm** = 27 cm

1e 2.5 m = **250 cm**

1f **50,000 mm** = 50 m

1g **8,500 g** = 8.5 kg

1h 3.75 l = **3,700 ml**

2 4.2 kg

3a 5 miles ≈ **8 km**

3b 50 miles ≈ **80 km**

3c **10 miles** ≈ 16 km

3d 32 km ≈ **20 miles**

3e 240 miles ≈ **384 km**

3f **256 km** ≈ 160 miles

3g **100 miles** ≈ 160 km

3h 4,000 km ≈ **2,500 miles**

4 6,848 ounces

5 190.5 cm

6 170 gallons

Crack the code: imperial

Real world maths: approximately 7 hours

(486 km ≈ 304 miles 304 miles ÷ 60 miles per hour ≈ 5 hours + 2 hours crossing)

Talk it out: Answers will vary, but the largest baby was **71 cm** long.

Autumn term Self-assessment

1 2,142,413

2

		6	3	7	8	9	0	7
	+			4	8	2	9	3
		6	**4**	**2**	**7**	**2**	**0**	**0**
			1	1	1	1	1	

		7	3	~~8~~ 9	~~11~~ 2	~~9~~ ~~10~~ 0	~~10~~ 1	1 3
	−			3	8	7	1	9
		7	**3**	**5**	**3**	**2**	**9**	**4**

3

		2	4	2	
×			1	2	
		4	8	4	
	2	4	2	0	
	2	**9**	**0**	**4**	
		1			

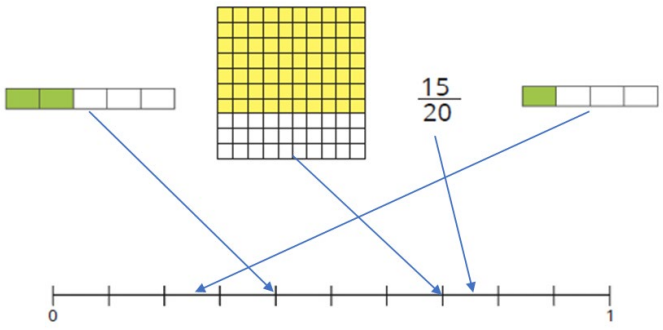
	1	3	5	5	
×			2	4	
	5	4	2	0	
2	7	1	0	0	
3	**2**	**5**	**2**	**0**	
1					

4

		2	**8**		
	3	8	4		

		3	**2**	**1**	
	2	6	4	2	

5



6 120 seconds (<) 2 hours

2 kg (>) 200 grams

0.3 litres (>) 30 ml

400 mm (<) 0.4km

Spring term Week 1

Let's remember

1 8 km = **800,000 cm**

2 $\frac{5}{8}$ of 648 = **405**

3 $7 - 2\frac{2}{5} = \mathbf{4\frac{3}{5}}$

4 Twenty-four thousand, five hundred and eighteen

Let's practise

1a 3, 9, **15 or 27**

1b 20, 10, **5 or 0**

1c 7, 28, **49 or 112**

1d 10,000, 30,000, **50,000 or 90,000**

2 24

3a 3 : 4

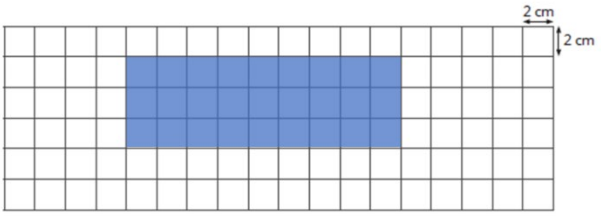
3b 4 : 3

3c $\frac{3}{7}$

3d $\frac{4}{7}$

4 3 : 5

5 $\frac{3}{5}$

6 

Crack the code: scale

Talk it out: Answers will vary, for example,

Ratio means how much of one thing there is compared to another. The symbol : represents the order of parts. So to make pink paint, I need to mix 2 parts red paint and 5 parts white paint, 2 : 5. Each part needs to be the same amount.

Think it out: Chickens = 45

Spring term Week 2

Let's remember

1 45 or 25

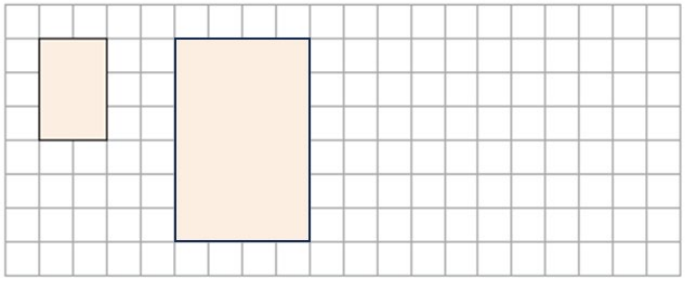
2 40 km ≈ **25 miles**

3 $\frac{1}{2} \div 3 = \mathbf{\frac{1}{6}}$

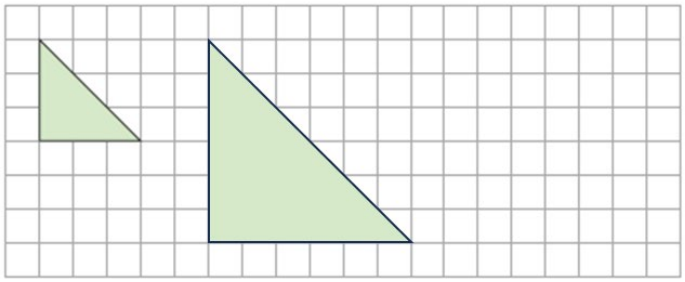
4 −5 + 12 = **7**

Let's practise

1a



1b



2a 9 pears

2b 16 apples

3a 198 mm

3b 3

4 £19.50

5 £1.80

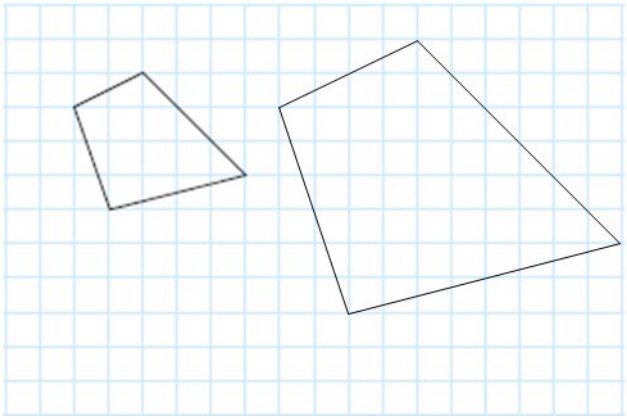
6 600 g

Crack the code: factor

Real world maths: Answers may vary, for example,

Method 1	Method 2
70 oranges ÷ 5 = 14 boxes	£1.80 ÷ 5 = £0.36 so the oranges cost 36p each
14 × £1.80 = £25.20	£0.36 × 70 = 2520p = £25.20

Talk it out:



The sides are diagonal so it is more challenging, but you can count how many squares across and up/down there are between vertices.

Spring term Week 3

Let's remember

1 20

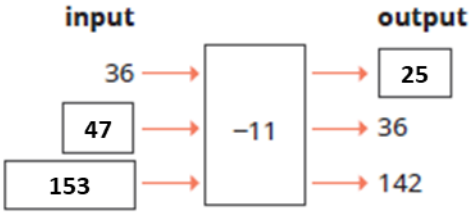
2 18

3 $\frac{2}{5}$ of **45** = 30

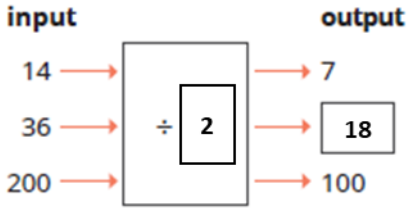
4 57,208 – 8,931 = **48,277**

Let's practise

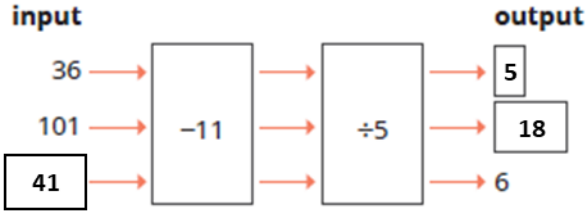
1a



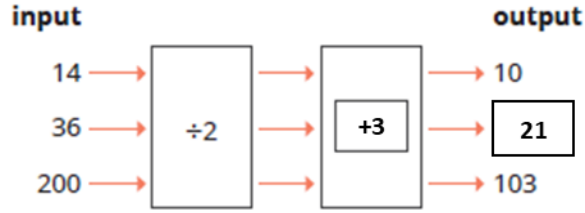
1b



2a



2b



3a $3m + 4$

3b $7m + 2$

3c $8 + 5m$

3d $3 + 5m$

4a $5 + 7 + 12 = 24$

4b $7 - 5 = 2$

4c $12 + 12 + 7 - 5 = 26$

4d $12 - (7 + 5) = 0$

5a $y + 7 =$ **15**

5b $y - 3 =$ **5**

5c $4y =$ **32**

5d $\frac{y}{2} =$ **4**

5e $123 + y =$ **131**

5f $y - 8 =$ **0**

5g $4y + 5 = 37$

5h $7y - 3 =$ **53**

Crack the code: function

Think it out:

$a + b = 12$	$a + b = 12$
0 + 12 = 12	7 + 5 = 12
1 + 11 = 12	8 + 4 = 12
2 + 10 = 12	9 + 3 = 12
3 + 9 = 12	10 + 2 = 12
4 + 8 = 12	11 + 1 = 12
5 + 7 = 12	12 + 0 =12

Talk it out: Answers may vary, for example,

I know that x, y, the heart and the star all represent numbers.

I need to multiply in the first puzzle and the question is 5 × 7 = 35

I know that xy means x multiplied by y. So the answer to the second puzzle is 5 × 5 = 25

Spring term Week 4

Let's remember

1 $2a$ = **42**

2 150 g

3 8,000 m

4 1,728

Let's practise

1a $x + 21 = 30$

$x = 9$

1b $y + 11 = 52$

$y = 41$

1c $p + 157 = 206$

$p = 49$

1d $2b = 120$

$b = 60$

2 **200**

Annie: $x - 17 = 23$

$x = 40$

Mo: $5x = y$

$5 \times 40 = 200$

3a $2x + 30 = 40$

$x = 5$

3b $3y + 11 = 71$

$y = 20$

3c $4p + 160 = 200$

$p = 10$

3d $5b + 76 = 156$

$b = 16$

4 12 ($2x + 23 = 47$)

5 p and m could be: 1 cm and 96 cm; 2 cm and 48 cm; 3 cm and 32 cm; 4 cm and 24 cm; 6 cm and 16 cm; 8 cm and 12 cm

Crack the code: integer

Talk it out: a = 7 cm

The perimeter of the parallelogram is 18 cm (5 cm + 5 cm + 4 cm + 4 cm) so the perimeter of the triangle must be 18 cm.

To find the missing value a, I need to subtract the known length of the triangle from the perimeter and divide the answer by 2.

18 cm – 4 cm = 14 cm ÷ 2 = 7 cm

Real world maths:

£C = (5 × 150) + 432 = £1,182

Profit = 150 × £9.50 = £1,425 − £1,182 = **£243**

Spring term Week 5

Let's remember

1 y = 27

2 A = 36

3 $\frac{3}{7}$

4 2,801 × 19 = 53,219

Let's practise

1a There are **3** tenths, **2** hundredths and **7** thousandths.

The number is **0.327**

1b There are **7** tenths, **0** hundredths and **2** thousandths.

The number is **0.702**

2a 1.56 = 1 + 0.5 + 0.06

2b 0.735 = 0.7 + 0.03 + 0.005

2c 8.071 = 8 + 0.07 + 0.001

2d 12.706 = 10 + 2 + 0.7 + 0.006

(or any correct partitioning)

3a

3b 9

3c 8.7

4a 6.48: 6 6.5

4b 3.81: 4 3.8

4c 9.67: 10 9.7

4d 0.09: 0 0.1

5a 3.25 + 4.03 = **7.28**

5b 7.64 – 1.31 = **6.33**

5c 9.57 + 2.381 = **11.951**

5d 12.543 – 8.06 = **4.483**

5e 17.632 + 18.598 = **36.23**

5f 9.047 – 3.259 = **5.788**

6a 0.933 m

6b 93.3 cm

Crack the code: thousandths

Talk it out: Answers will vary.

Real world maths: Answers will vary.

Spring term Week 6

Let's remember

1 6

2 $b = 8$

3 40 cm

4 5,376 ÷ 42 = **128**

Let's practise

1a 6 × 10 = 60

6 × 100 = 600

6 × 1,000 = 6,000

1b 3.2 × 10 = 32

3.2 × 100 = 320

3.2 × 1,000 = 3,200

1c 0.56 × 10 = 5.6

0.56 × 100 = 56

0.56 × 1,000 = 560

1d 0.007 × 10 = 0.07

0.007 × 100 = 0.7

0.007 × 1,000 = 7

2a 53 ÷ 10 = 5.3

53 ÷ 100 = 0.53

53 ÷ 1,000 = 0.053

2b 9 ÷ 10 = 0.9

9 ÷ 100 = 0.09

9 ÷ 1,000 = 0.009

3a 3.24 × 2 = 6.48

3b 2.01 × 9 = 18.09

3c 5.104 × 3 = 15.312

3d 4.7 × 8 = 37.6

3e 6.31 × 7 = 44.17

3f 8.235 × 6 = 49.41

4a 42 ÷ 7 = 6

4.2 ÷ 7 = 0.6

4b 63 ÷ 9 = 7

0.63 ÷ 9 = 0.07

4c 96 ÷ 8 = 12

9.6 ÷ 8 = 1.2

4d 216 ÷ 6 = 36

2.16 ÷ 6 = 0.36

4e 4,356 ÷ 3 = 1,452

43.56 ÷ 3 = 14.52

4f 144 ÷ 12 = 12

1.44 ÷ 12 = 0.12

5 2,400 g

6 9.12 m

Crack the code: decimals

Real world maths: The notebooks are cheaper in shop B by 2p per book.

Think it out: 3.5 × 10 = 35 350 ÷ 10 = 35

Spring term Week 7

Let's remember

1 2.4 × 8 = **19.2**

2 3.75 + 0.201 = **3.951**

3 $d - 7$

4 (5 + 3) × 9 **>** 5 + 3 × 9

Let's practise

1a $\frac{17}{100}$ 1d $\frac{7}{10}$ 1g $\frac{4}{5}$

1b $\frac{23}{100}$ 1e $\frac{14}{25}$ 1h $\frac{1}{2}$

1c $\frac{9}{100}$ 1f $\frac{1}{50}$ 1i $\frac{3}{4}$

2a 0.13 2d 0.2 2g 0.98

2b 0.71 2e 0.42 2h 0.85

2c 0.3 2f 0.56 2i 0.15

3 No, $\frac{1}{4}$ is 1 divided by 4, which is 0.25

4a 65% 4b 42% 4c 8% 4d 25%

5a 17% 5c 22% 5e 75%

5b 11% 5d 50% 5f 80%

6

Fraction	Decimal	Percentage
$\frac{19}{100}$	0.19	19%
$\frac{7}{10}$	0.7	70%
$\frac{3}{4}$	0.75	75%
$\frac{3}{5}$	0.6	60%
$\frac{23}{100}$	0.23	23%
$\frac{1}{2}$	0.5	50%

Crack the code: equivalent

Talk it out: Answers will vary, for example,

To write a fraction as a decimal you divide the numerator by the denominator. You can then write the decimal as a percentage by multiplying by 100

Think it out: Any decimal greater than 0.25 ($\frac{1}{4}$) and less than 0.65 (65%) created using each digit card only once: 0.31 0.35 0.37 0.39 0.51 0.53 0.59

Spring term Week 8

Let's remember

1 6%

2 12.96 ÷ 6 = **2.16**

3 Answers may vary, for example, a = 7 b = 6 or a = 4 b = 9

4 $\frac{3}{5}$ > $\frac{7}{15}$

Let's practise

1a $0.32 \bigcirc \frac{27}{100}$ (>)

1b $0.71 \bigcirc 9\%$ (>)

1c $\frac{4}{5} \bigcirc 0.45$ (>)

1d $\frac{1}{2} \bigcirc 39\%$ (>)

1e $5\% \bigcirc 0.5$ (<)

1f $\frac{9}{10} \bigcirc 90\%$ (=)

2a 9% $\frac{11}{100}$ 12% $\frac{1}{5}$ 0.32

2b 0.08 25% 0.6 70% $\frac{3}{4}$

2c $\frac{27}{50}$ 0.63 71% $\frac{19}{25}$ 82%

3a 50% of 60 = 30

3b 25% of 60 = 15

3c 10% of 60 = 6

3d 25% of 720 = 180

3e 1% of 12,000 = 120

3f 50% of 5,600 = 2,800

4a 75% of 320 = 240

4b 30% of 70 = 21

4c 7% of 200 = 14

4d 45% of 500 = 225

4e 51% of 1,000 = 510

4f 99% of 4,900 = 4,851

5 £84

Crack the code: percent

Talk it out: Answers may vary.

50% of 120 = 60

25% of 240 = 60

10% of 600 = 60

Real world maths: The test was out of 60 marks (3 marks = 5%, so 60 marks = 100%)

Max: 70% of 60 = **42** Dora: 75% of 60 = **45**

Spring term Week 9

Let's remember

1 25% of 380 = **95**

2 $\frac{13}{17}$

3 0.06

4 $\frac{17}{20} - \frac{3}{4} = \mathbf{\frac{1}{10}}$

Let's practise

1a A = 84 cm^2

P = 38 cm

1b A = 126 cm^2

P = 54 cm

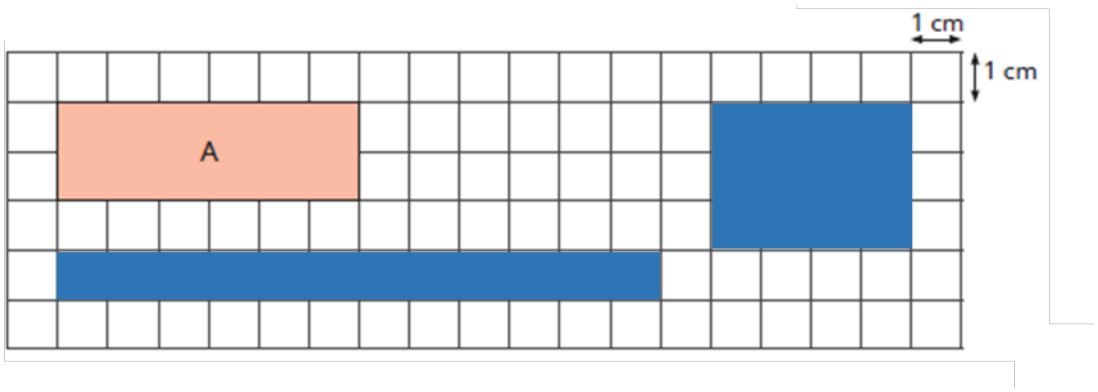
1c A = 1,456 mm^2

P = 160 mm

1d A = 350 mm^2

P = 114 mm

2



3a P = 30 cm

3b 46 cm

4a A = 63 cm^2

4b A = 728 mm^2

5 Perimeter of the rectangle = 176 mm

Crack the code: perimeter

Talk it out:

An equilateral triangle is a triangle that has three sides that are the same length.

I know the length of one side of the equilateral triangle, so I know that the other sides are the same length, that is 5 cm.

I also know that one side of the square is equal to 2 triangles so one side of the square is 10 cm.

A square has all four sides that are the same length so the perimeter of the shape is:

10 + 10 + 10 + 5 + 5 + 5 + 5 = **50 cm**

Think it out:

Total area = (4 × 7) × (5 × 7) = 980 cm^2

Shaded area = **147 cm^2**

Unshaded area = 980 − 147 = **833 cm^2**

Spring term Week 10

Let's remember

1 36 cm^2

2 3% of 250 = **7.5**

3 £1.96

4 $\frac{3}{8} \times \frac{5}{6} = \mathbf{\frac{5}{16}}$

Let's practise

1a A = 504 mm^2

1b 252 mm^2

2a A = 640 cm^2

2b A = 63 cm^2

3a 1,800 mm^2

3b 21.6 cm^2

4 11 cm^3

5a 9,600 mm^3 5b 8 cm^3

Crack the code: shapes

Talk it out:

You can't be sure that the shape's volume is 16cm^3 because you don't know how many cubes are on the side of the shape that you can't see.

The smallest volume of the shape is 16 cm^3

Think it out: The area of the shaded region is **4.5 cm^2**

Spring term Week 11

Let's remember

1 35 mm^2

2 Perimeter of the rectangle = 16.8 cm

3 20%

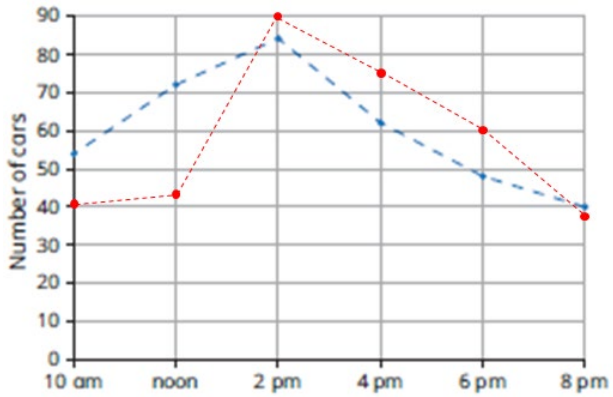
4 120

Let's practise

1a 84

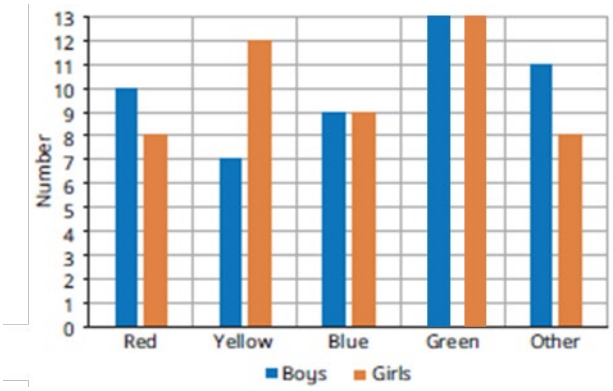
1b 14

1c No because data was not recorded at this specific time.

1d 

2a 2

2b 5

2c 

3a chocolate

3b other

3c No, because we don't know how many people voted altogether.

Crack the code: whole

Real world maths:

a Wednesday because a lot fewer children walked to school on that day.

b 28

c $\frac{4}{7}$

Talk it out:

I agree with Eva because we don't know how many games each team has played so we can't know who won the most.

Spring term Week 12

Let's remember

1 25

2 14.4 cm^2

3 25% of **368** = 92

4 44 pounds ≈ **20 kg**

Let's practise

1

Flavour	Frequency
Vanilla	125
Chocolate	250
Strawberry	50
Mint	45
Other	30

2a 180

2b 72

3a

Age	Frequency	Angle
11	24	72°
12	26	78°
13	32	96°
14	18	54°
15	20	60°
Total	120	360°

3b Answers may vary, for example,

Tiny forgot to include data for children aged 15 years old; it looks like $\frac{1}{4}$ of the children are 11, which would be 30 children, but from the table it is 24 children; the angle of the sector for 14 year olds is 54° but on the pie chart it is greater than 90°.

4a 5

4b 21

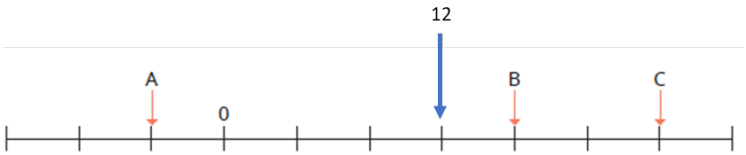
4c 245

4d 4.62

5 252 (42 × 6 = 252)

Crack the code: chart

Think it out:



Real world maths: Answers will vary.

Spring term Self-assessment

1 Ratio of apples to bananas: 6 : 8

2 $7n + 3$

3a 4.25 + 3.03 = 7.28

3b 18.622 + 17.598 = 36.22

3c 6.64 – 2.31 = 4.33

3d 9.045 – 2.249 = 6.796

3e 4.23 × 2 = 8.46

3f 6.135 × 6 = 36.81

3g 54 ÷ 9 = 6

3h 0.54 ÷ 9 = 0.06

4 42% 0.42 $\frac{42}{100} = \frac{21}{50}$

5 Area = 17 cm^2

Perimeter = 20 cm

Summer term Week 1

Let's remember

1 10

2 150

3 576 cm^2

4 50

Let's practise

1 23°

2a acute 2b reflex

3a 20° 3b 60°

4a a = 74° b = 106°

4b h = 54° i = 126° j = 126°

5 110°

Crack the code: interior

Real world maths: Answers will vary.

Think it out:

Angle a = 40°

Angle b = 80°

Angle c = 160°

Angle d = 80°

Summer term Week 2

Let's remember

1 Vertically opposite angles are equal.

2 90°

3 34.8 cm^2

4 6

Let's practise

1a 48°

1b 34°

1c 67°

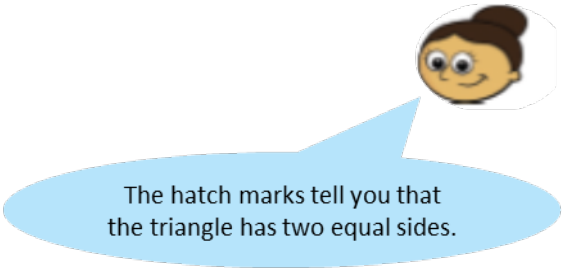
1d 47°

2a a = 74°

2b b = 44°

3a a = 39°

3b b = 45°



4 Yes, this is an isosceles triangle. The unknown angle is 24° because 180 – 132 – 24 = 24. An isosceles triangle has base angles that are equal and the base angles are both 24°

5a a = 83°

5b b = 76°

Crack the code: equilateral

Talk it out: Answers may vary, for example,

The four types of triangles I can describe are equilateral, isosceles, scalene and right-angled triangles.

An equilateral triangle has 3 sides of equal length and all the angles are the same. An isosceles triangle has 2 sides of equal length and the base angles are the same. A scalene triangle has 3 different length sides and 3 different angles. A right-angled triangle has one angle that is 90°.

Think it out: Answers may vary, for example,

$w + 37° + x = 180°$

$180° - 37° = y + z$

$x = y = 90°$

$w = z$

Summer term Week 3

Let's remember

1 180°

2 obtuse

3 40

4 add 16 or multiple by 3

Let's practise

1a $a = 70°$

1b $b = 45°$

1c $c = 72°$

1d $d = 42°$

2a 540°

2b 720°

2c 1,080°

2d 1,440°

3 $p = 116°$

4a t = 150°

4b 210°

5 diameter = 14 cm

Crack the code: polygon

Think it out: Angle x = 90°

Internal angle of a hexagon = 120°

Equilateral triangle angle = 60°

Square = 90°

Angles around at point = 360°

360 – 120 – 60 – 90 = 90°

Talk it out: Answers may vary, for example,

A polygon is a closed shape with three or more straight sides.

A regular shape has all sides the same length and all angles that are the same.

Summer term Week 4

Let's remember

1 The straight line from the centre of a circle to the circumference is called the radius.

2 70° and 70°, or 40° and 100°

3 140 cm

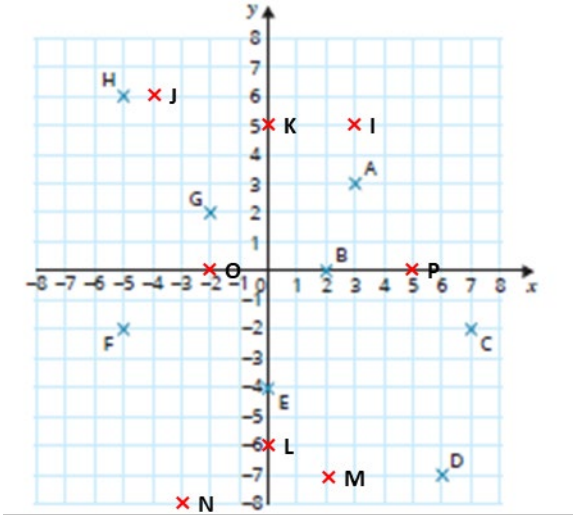
4 h = 107

Let's practise

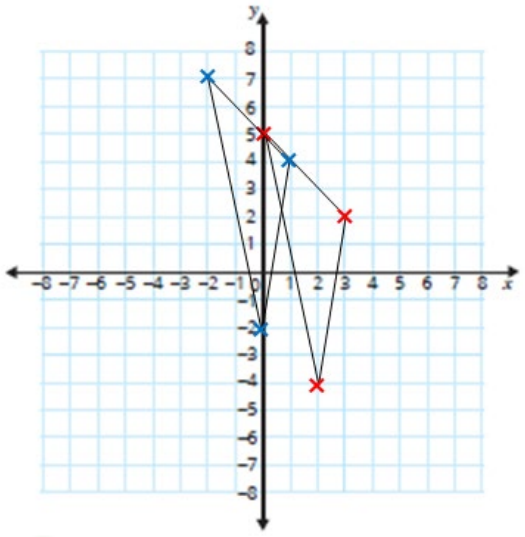
1a

A (3, 3)	C (7, −2)	E (0, −4)	G (−2, 2)
B (2, 0)	D (6, −7)	F (−5, −2)	H (−5, 6)

1b

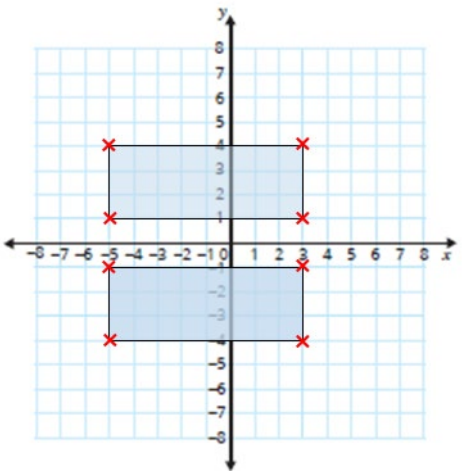


2



(−2, 7) (1, 4) (0, −2)

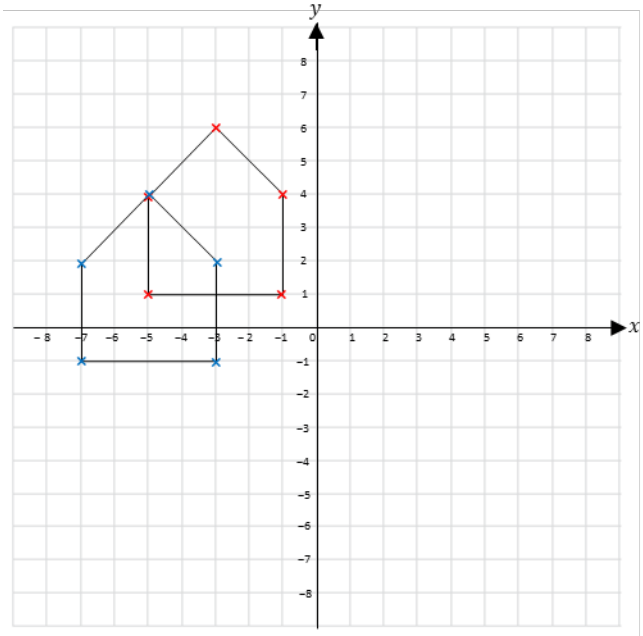
3



(3, −1) (−5, −1) (−5, −4) (3, −4)

Crack the code: axis

Think it out:



(−7, −1) (−7, 2) (−5, 4) (−3, 2) (−3, −1)

Summer term Week 5

Let's practise

1 Six million and fifty-four thousand 6,054,000

2 5,605

3a 48,499

3b 47,500

3c 999

4 −23 degrees Celsius

5 640 (greatest common factor of 24 and 32 = 8; first common multiple of 16 and 20 = 80)

6 131

4

21

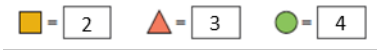
Crack the code: calculate

Real world maths: Answers will vary.

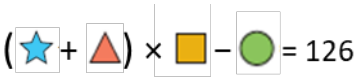
Think it out: Answers will vary.

Summer term Week 6

Let's practise

1a For example, 

1b Any numbers for the square and triangle but the circle must be 0 or 1

2 

(17 + 15) × 4 − 2 = 126

3 $32\frac{8}{15}$ cm

4 $78\frac{2}{5}$ m

5 $\frac{1}{36}$ kg

6 £342

7 0.24 km

8 p = 360 or 300

Crack the code: formula

Think it out: $\frac{3}{4} - \frac{1}{8} = \frac{5}{8}$

Talk it out:

A mixed number has two parts: a whole number and a fraction.

An improper fraction has a numerator that is greater than the denominator.

Summer term Week 7

Let's practise

1 144

2a 125 g flour, 62.5 g sugar, 1.25 tbsp vanilla essence, 62.5 g butter, 1.25 eggs

2b 500 g flour, 250 g sugar, 5 tbsp vanilla essence, 250 g butter, 5 eggs

3 m = 0 n = 10; m= 1 and n = 8; m = 2 and n = 6; m = 3 and n = 4; m = 4 and n = 2; m = 5 and n = 0

4 £7.68

5a $2x + 32 = 180$

5b x = 74 , 106

6 e.g. 80p + 45p, 90p + 35p, 75p + 50p, 92p + 33p

7 4.2 m², £43.95

Crack the code: equation

Real world maths: Answers will vary.

Think it out: Answers will vary.

Summer term Week 8

Let's practise

1. Jo, Max, Kim

2a. 2

2b. 390

2c. 35,640

3. Yes. The area of the parallelogram is equal to 18 × 9 = 162 cm^2, so the area of the triangle is 324 cm^2. The base is 24 cm and 24 × 27 ÷ 2 = 324 so 27 must be the vertical height.

4. 9 cm × 6 cm × 12 cm = 648 cm^3
12 cm × 6 cm × 10 cm = 720 cm^3
25 cm × 6 cm × 10 cm = 1,500 cm^3
648 cm^3 + 720 cm^3 + 1,500 cm^3 = 2,868 cm^3

5. 3

6. 40

Crack the code: square

Real world maths: Answers will vary

Summer term Week 9

Let's practise

1a. 48°

1b. 52°

1c. 173°

1d. 123°

2. 84°

3. (–2, –9)

4. (–1, –2)

5. 18 square units

Crack the code: triangle

Talk it out: Answers will vary.

Think it out: square, hexagon, rhombus, trapezium

Summer term Week 10

Let's practise

1a. 924

1b. 12,059

1c. 126,413

1d. 2,143,630

1e. 3,041,549

1f. 724,812

2a. 191,949

2b. 53,095

2c. 1,926.4

2d. 26,775

3a. 0.6

3b. 0.875

3c. 0.55

3d. 0.94

4a. 1,521

4b. 1,764

4c. 9,409

4d. 16,129

5a. 3,375

5b. 21,952

5c. 27,000

5d. 125,000

6a. 36

6b. 374

6c. 1,520

6d. 600,000

6e. 1,470

6f. 1

7. Jack forgot to add the 0 to record the pence amount as 40p; £32.40

Crack the code: operations

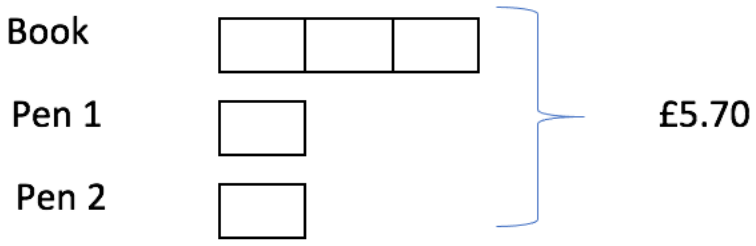
Think it out: 1st part: x = 7, p = 47, y = 11, q = 120
2nd part: x = 24.5, p = 205.928, y = 11.23, q = 28,500

Real world maths: Answers will vary.

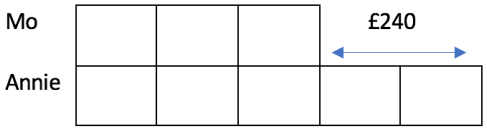
Summer term Week 11

Let's practise

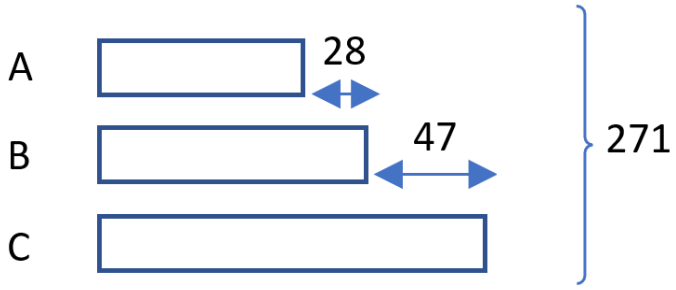
1. 956



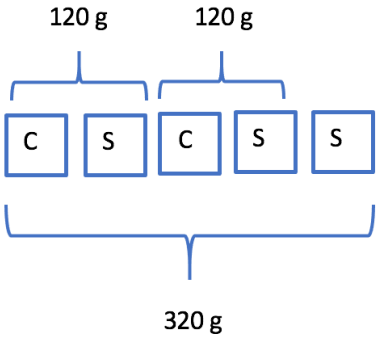
2. £ 2.28



3. £ 600

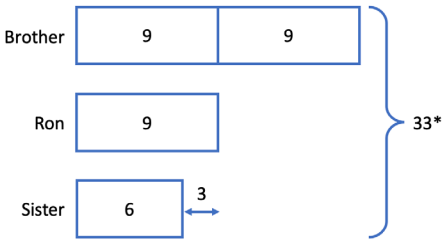


4. 131



5.

320 - 240 = 80, so cube = 80 g; 120 - 80 = 40, so sphere = 40 g



6.

* The mean age is 11, so the sum of their ages is 33 33 + 3 = 36 36 ÷ 4 = 9

Crack the code: reason

Think it out: Answers will vary.

Summer term Week 12

Let's practise

1. 4

2. $\frac{13}{35}$

3. 324 cm²

4. 55

5. 32 cm^2

6. 36

Crack the code: check

Think it out: 108 mm

Summer Self-assessment

1. 38°
2. 134°

3.