

Year 6 Maths

Arithmetic 1: Questions

1	$16 - 20 =$ <div></div>	<div></div> 1 mark
2	$236 - 30 \times 6 =$ <div></div>	<div></div> 1 mark
3	$368,701 + 10,000 + 10,000 =$ <div></div>	<div></div> 1 mark
4	$2,954 \times 9 =$ <div></div>	<div></div> 1 mark
5	$8,253 \div 4 =$ <div></div>	<div></div> 1 mark
6	$3,300 \div 30 =$ <div></div>	<div></div> 1 mark
7	$328,088 + 75,253 =$ <div></div>	<div></div> 1 mark
8	$42,000 \div 70 =$ <div></div>	<div></div> 1 mark

Year 6 Maths

9	$\frac{1}{7} \times \frac{1}{3} =$	<input type="text"/>	<input type="text"/> 1 mark
10	$\begin{array}{r} 75.83 \\ \times \quad 5 \\ \hline \end{array}$	<input type="text"/>	<input type="text"/> 1 mark
11	$56.97 + 8.152 =$	<input type="text"/>	<input type="text"/> 1 mark
12	$99,999 + 200 =$	<input type="text"/>	<input type="text"/> 1 mark
13	$1^3 + 2^3 + 4^2 =$	<input type="text"/>	<input type="text"/> 1 mark
14	$600 \times 40 =$	<input type="text"/>	<input type="text"/> 1 mark
15	$99,999 - 5,000 =$	<input type="text"/>	<input type="text"/> 1 mark
16	$\begin{array}{r} 636,342 \\ - 217,838 \\ \hline \end{array}$	<input type="text"/>	<input type="text"/> 1 mark

Year 6 Maths

17	$444,005 - ? = 22,006$	<input type="text"/>	<input type="text"/> 1 mark
18	$6.3 \div 100 =$	<input type="text"/>	<input type="text"/> 1 mark
19	$0.3 \times 12 =$	<input type="text"/>	<input type="text"/> 1 mark
20	$340.27 - 3.905 =$	<input type="text"/>	<input type="text"/> 1 mark
21	$80 \times 120 =$	<input type="text"/>	<input type="text"/> 1 mark
22	$238.1 \times 1000 =$	<input type="text"/>	<input type="text"/> 1 mark
23	$50 \times 80 - 40 =$	<input type="text"/>	<input type="text"/> 1 mark
24	$8 + 7 \times 3 - 4 =$	<input type="text"/>	<input type="text"/> 1 mark

Year 6 Maths

25	$\begin{array}{r} 476 \\ \times 83 \\ \hline \end{array}$	<input type="text"/>	<input type="text"/> 2 marks
26	$\frac{2}{3} + \frac{5}{12} =$	<input type="text"/>	<input type="text"/> 1 mark
27	$\frac{5}{8} \times 9 =$	<input type="text"/>	<input type="text"/> 1 mark
28	$\begin{array}{r} 3678 \\ \times 29 \\ \hline \end{array}$	<input type="text"/>	<input type="text"/> 2 marks
29	$42.3 \div 5 =$	<input type="text"/>	<input type="text"/> 1 mark
30	$36 \overline{)7521} =$	<input type="text"/>	<input type="text"/> 2 marks
31	$\frac{5}{4} - \frac{5}{6} =$	<input type="text"/>	<input type="text"/> 1 mark
32	$5\% = \frac{?}{20}$	<input type="text"/>	<input type="text"/> 1 mark

Year 6 Maths

33	42% of 90 = <input data-bbox="951 300 1166 384" type="text"/>	<input data-bbox="1276 289 1357 373" type="text"/> 1 mark
34	$\frac{6}{7} \div 2 =$ <input data-bbox="951 520 1166 604" type="text"/>	<input data-bbox="1276 510 1357 594" type="text"/> 1 mark
35	$0.6 = \frac{?}{20}$ <input data-bbox="951 741 1166 825" type="text"/>	<input data-bbox="1276 730 1357 814" type="text"/> 1 mark
36	$3\frac{1}{8} - \frac{1}{4} =$ <input data-bbox="951 972 1166 1056" type="text"/>	<input data-bbox="1276 961 1357 1045" type="text"/> 1 mark
37	$2\frac{2}{5} \times 4 =$ <input data-bbox="951 1192 1166 1276" type="text"/>	<input data-bbox="1276 1182 1357 1266" type="text"/> 1 mark

Year 6 Maths

Arithmetic Answers

1. -4 [1]

2. 56 [1]

3. 388,701 [1]

4. 26,586 [1]

5. 2,063 rem 1 or equivalent [1]
e.g. 2,063.25

6. 110 [1]

7. 403,341 [1]

8. 600 [1]

9. $\frac{1}{21}$ [1]

10. 379.15 [1]

11. 65.122 [1]

12. 100,199 [1]

13. 25 [1]

Accept 5^2

14. 24,000 [1]

15. 94,999 [1]

16. 418,504 [1]

17. 421,999 [1]

18. 0.063 [1]

19. 3.6 [1]

20. 336.365 [1]

21. 9,600 [1]

22. 238,100 [1]

23. 3,960 [1]

24. 25 [1]

25. For 2 marks: 39,508 [2]

For 1 mark:

$$\begin{array}{r} 476 \\ \times 83 \\ \hline 1428 \\ 38080 \\ \hline 39508 \end{array}$$

An error in one row, then added correctly, or an error in the addition

26. $1\frac{1}{12}$ or equivalent [1]

e.g. $\frac{13}{12}$

27. $5\frac{5}{8}$ or equivalent [1]

e.g. $\frac{45}{8}$

Do not accept unconventional

mixed numbers e.g. $4\frac{13}{8}$

28. For 2 marks: 106,662 [2]

For 1 mark:

$$\begin{array}{r} 3678 \\ \times 29 \\ \hline 33102 \\ 73560 \\ \hline 106662 \end{array}$$

An error in one row, then added correctly, or an error in the addition

29. 8.46 [1]

Year 6 Maths

30. For 2 marks: [2]
208 rem 33 or equivalent

For 1 mark:

Evidence of either long division or short division method with only one error (carry figures must be seen in a short division method).

31. $\frac{5}{12}$ or equivalent [1]

32. $\frac{1}{20}$ [1]

33. 37.8 [1]

34. $\frac{3}{7}$ [1]

35. $\frac{12}{20}$ [1]

36. $2\frac{7}{8}$ or equivalent [1]

e.g. $\frac{23}{8}$

Do not accept unconventional

mixed numbers e.g. $1\frac{15}{8}$

37. $9\frac{3}{5}$ or equivalent [1]

e.g. $\frac{48}{5}$

Do not accept unconventional

mixed numbers e.g. $8\frac{8}{5}$

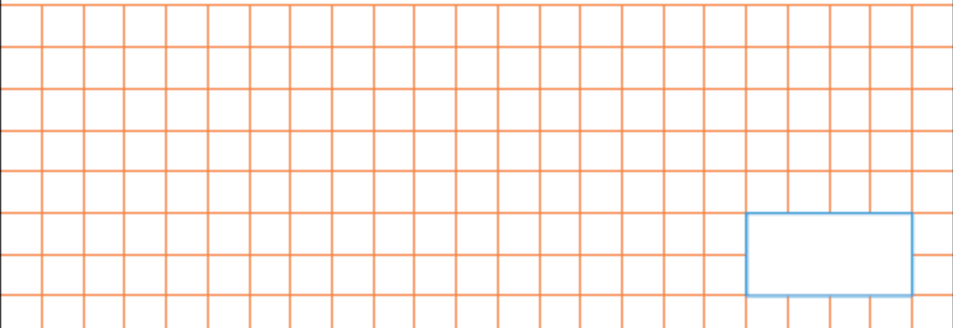


Arithmetic 2: Questions


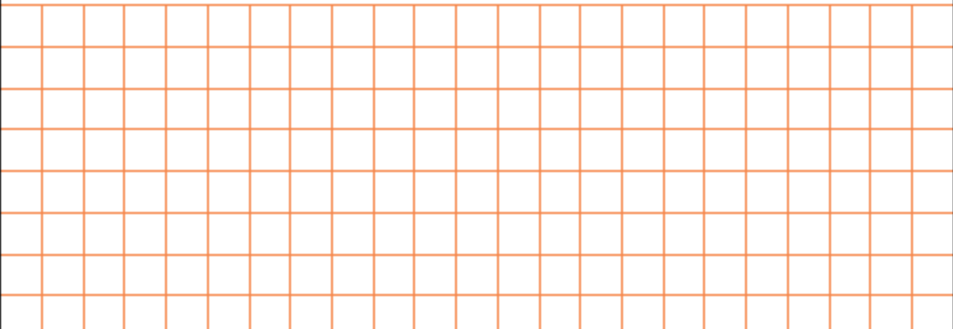

1 mark

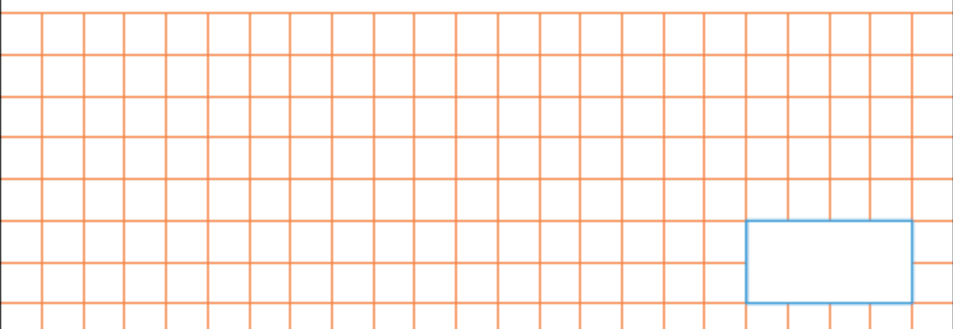


1 mark

1 mark

Year 6 Maths

4	$742 - 8 =$																			
																				
																				
																				
1 mark																				

5	 $= 56 \div 7$																			
																				
																				
1 mark																				

6	$69\,997 + 5\,601 =$																			
																				
																				
																				
1 mark																				

Year 6 Maths

7

$$= 6853 - 684$$

1

1 mark

8

$5 \times 7 \times 4 =$

1 mark

9

$8.4 + 0.3 =$



1 mark

Year 6 Maths

10 $726 \div 6 =$

1 mark

11 $3 - 12 =$

1 mark

12 $91 =$ $\times 7$

1 mark

Year 6 Maths

13 $263 \div 100 =$

1 mark

14 $26.8 + 1.002 =$

1 mark

15 $40 \times 300 =$

1 mark

Year 6 Maths

16 $2\,407\,562 - 10\,000 =$

☐

1 mark

17 $\frac{3}{7} + \frac{2}{7} =$

☐

1 mark

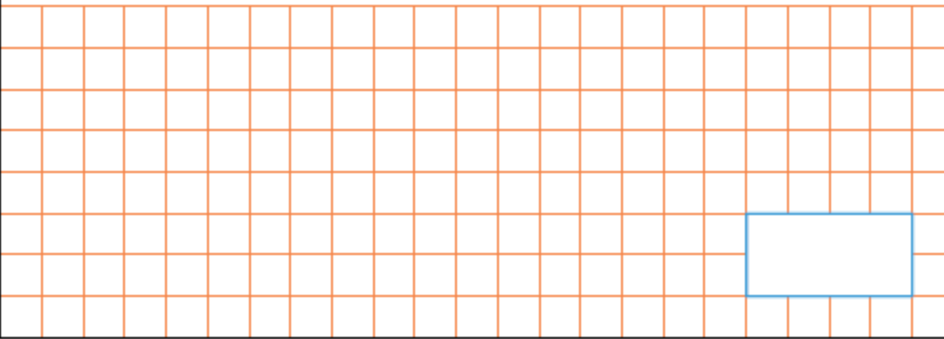
18 $1\,000 \times 30.7 =$

☐

1 mark

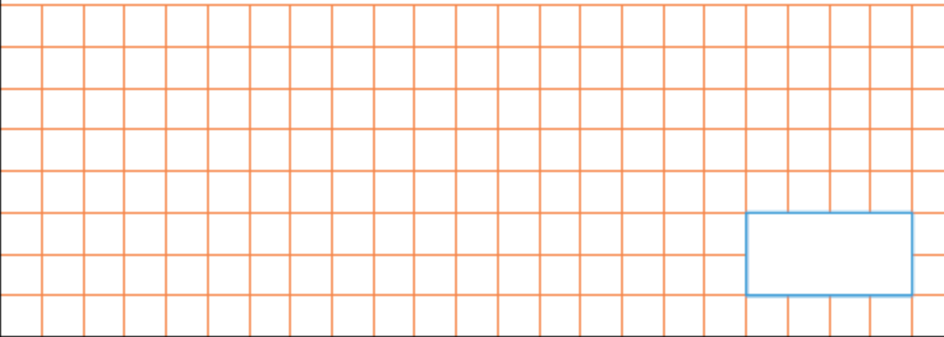
Year 6 Maths

19 $7\,700 \div 11 =$

☐

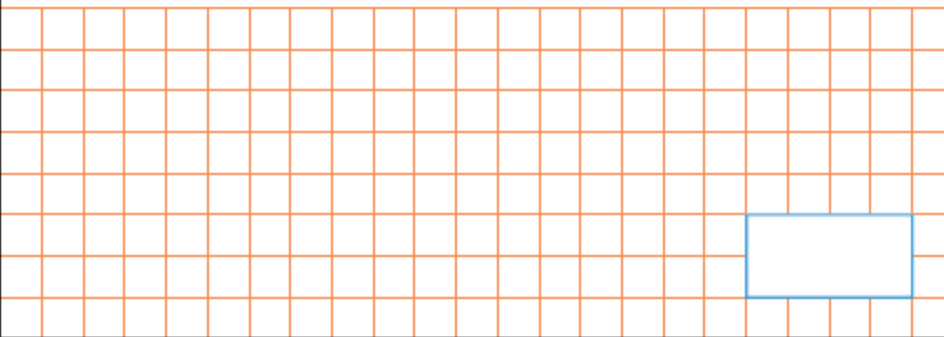
1 mark

20 $24.325 - 9.63 =$

☐

1 mark

21 $10\,000\,000 - 101 =$

☐

1 mark

Year 6 Maths

22

$$\frac{1}{6} + \boxed{} = \frac{5}{12}$$

☐

1 mark

23

$$8^2 + 17 =$$

☐

1 mark

24

$$1\frac{4}{9} \times 3 =$$

☐

1 mark

Year 6 Maths

$$25 \quad \frac{5}{6} \text{ of } 240 =$$

1 mark

26	$2.56 \times 7 =$
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1 mark

27

1	9	4	5	6
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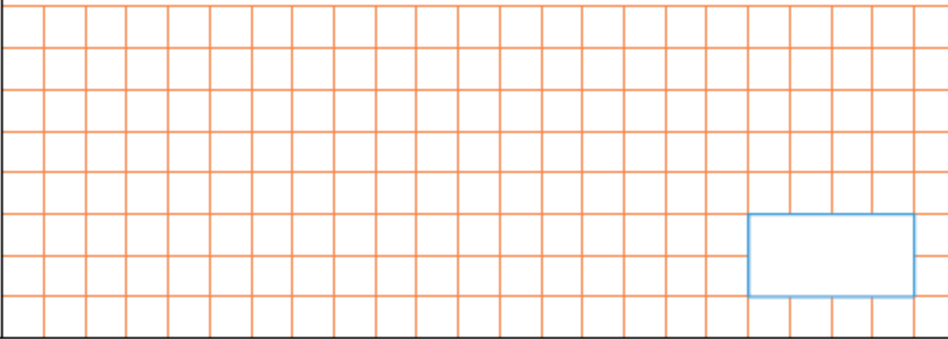
Show your method

2 marks

Year 6 Maths

28

30% of 3 200 =

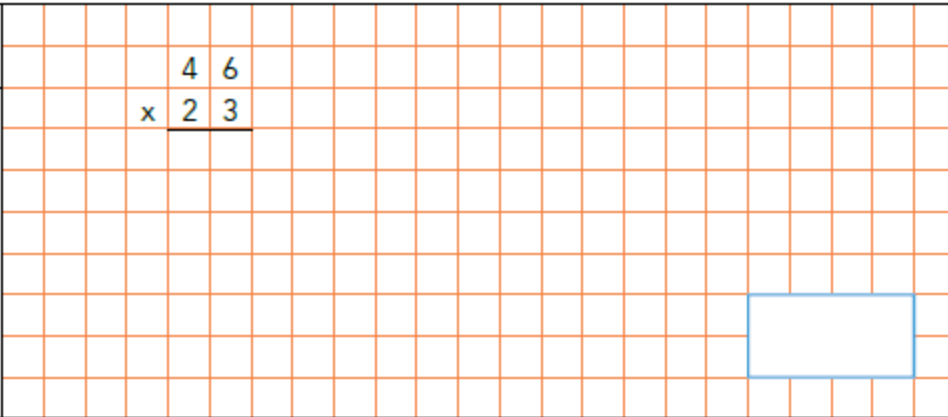
☐

1 mark

29

$$\begin{array}{r} 46 \\ \times 23 \\ \hline \end{array}$$

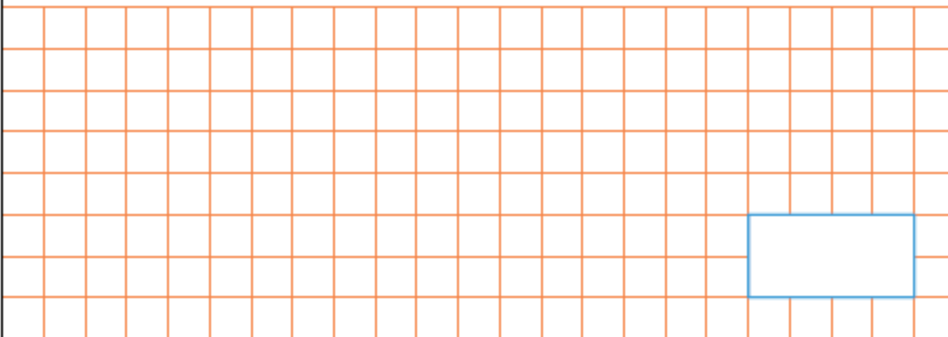
Show
your
method

☐

2 marks

30

$$\frac{3}{4} \div 3 =$$

☐

1 mark

Year 6 Maths

31

$$7 + 3 \times 5 =$$

☐

1 mark

32

2 7 | 1 4 3 1

Show
your
method

☐

2 marks

33

$$\frac{4}{7} \times \frac{5}{8} =$$

☐

1 mark

Year 6 Maths

34	$\begin{array}{r} 5208 \\ \times \quad 76 \\ \hline \end{array}$	<div>1 mark</div>
Show your method	<div></div>	

35	$3\frac{1}{4} - 1\frac{2}{3} =$	<div>2 marks</div>
	<div></div>	

36	$\frac{6}{7} \div 4 =$	<div>2 marks</div>
	<div></div>	

Year 6 Maths

Arithmetic 2 Answers

Q	Requirement	Mark	Additional guidance
1	88	1m	
2	3835	1m	
3	0	1m	
4	734	1m	
5	8	1m	
6	75 598	1m	
7	6169	1m	
8	140	1m	
9	8.7	1m	
10	121	1m	
11	-9	1m	
12	13	1m	Do not accept 9
13	2.63	1m	
14	27.802	1m	
15	12 000	1m	
16	2 397 562	1m	
17	5/7	1m	Accept equivalence
18	30 700	1m	
19	700	1m	
20	14.695	1m	

Year 6 Maths

Q	Requirement	Mark	Additional guidance
21	9 999 899	1m	
22	3/12 or 1/4	1m	Accept equivalence
23	81	1m	
24	3 12/9 or 4 1/3	1m	Accept equivalence
25	200	1m	
26	17.92	1m	
27	<p>Award TWO marks for the correct answer of 24</p> <p>If the answer is incorrect, award ONE mark for the formal methods of division with no more than ONE arithmetical error, i.e.</p> <ul style="list-style-type: none"> long division algorithm, e.g. $\begin{array}{r} 24 \text{ r } 2 \\ 19 \overline{) 456} \\ \underline{- 380} \quad (20 \times 19) \\ 76 \\ \underline{- 74} \text{ (error)} \quad (4 \times 19) \\ 2 \end{array} \quad \text{OR} \quad \begin{array}{r} 24 \text{ r } 10 \\ 19 \overline{) 456} \\ \underline{- 38} \quad (2 \times 19) \\ 86 \text{ (error)} \\ \underline{- 76} \quad (4 \times 19) \\ 10 \end{array}$ short division algorithm, e.g. $\begin{array}{r} 23 \text{ r } 18 \text{ (error)} \\ 19 \overline{) 456} \end{array}$ 	Up to 2m	<p>Working must be carried through to reach a final answer for the award of ONE mark.</p> <p>Short division methods must be supported by evidence of appropriate carrying figures to indicate the use of a division algorithm, and be a complete method. The carrying figure must be less than the divisor.</p>

Q	Requirement	Mark	Additional guidance
28	960	1m	
29	<p>Award TWO marks for the correct answer of 1 058</p> <p>If the answer is incorrect, award ONE mark for the formal method of long multiplication with no more than ONE arithmetical error, e.g.</p> $\begin{array}{r} 46 \\ \times 23 \\ \hline 138 \\ + 920 \\ \hline 1048 \text{ (error)} \end{array} \quad \text{OR} \quad \begin{array}{r} 46 \\ \times 23 \\ \hline 136 \text{ (error)} \\ + 920 \\ \hline 1046 \end{array}$	Up to 2m	<p>Working must be carried through to reach a final answer for the award of ONE mark.</p> <p>Do not award any marks if the error is in the place value, e.g. the omission of the zero when multiplying by tens:</p> $\begin{array}{r} 46 \\ \times 23 \\ \hline 138 \\ + 92 \text{ (place value error)} \\ \hline 230 \end{array}$
30	1/4	1m	Accept equivalence
31	22	1m	

Year 6 Maths

Q	Requirement	Mark	Additional guidance
32	<p>Award TWO marks for the correct answer of 53</p> <p>If the answer is incorrect, award ONE mark for the formal methods of division with no more than ONE arithmetical error, i.e.</p> <ul style="list-style-type: none"> long division algorithm, e.g. $\begin{array}{r} 54r13 \\ 27 \overline{) 1431} \\ \underline{- 1350} \quad (50 \times 27) \\ 0121 \quad (\text{error}) \\ \underline{- 108} \quad (4 \times 27) \\ 13 \end{array} \quad \text{OR} \quad \begin{array}{r} 53r3 \\ 27 \overline{) 1431} \\ \underline{- 135} \quad (5 \times 27) \\ 0081 \\ \underline{- 78} \quad (\text{error})(3 \times 27) \\ 3 \end{array}$ <ul style="list-style-type: none"> short division algorithm, e.g. $\begin{array}{r} 53r10 \\ 27 \overline{) 1431} \quad (\text{error}) \end{array}$	Up to 2m	<p>Working must be carried through to reach a final answer for the award of ONE mark.</p> <p>Short division methods must be supported by evidence of appropriate carrying figures to indicate the use of a division algorithm, and be a complete method. The carrying figure must be less than the divisor.</p>
33	5/14	1m	Accept 20/50 or equivalent fraction

Q	Requirement	Mark	Additional guidance
34	<p>Award TWO marks for the correct answer of 395 808</p> <p>If the answer is incorrect, award ONE mark for the formal method of long multiplication with no more than ONE arithmetical error, e.g.</p> $\begin{array}{r} 5208 \\ \times 76 \\ \hline 31248 \\ 364560 \\ \hline 395708 \quad (\text{error}) \end{array} \quad \text{OR} \quad \begin{array}{r} 5208 \\ \times 76 \\ \hline 31208 \quad (\text{error}) \\ 364560 \\ \hline 395768 \end{array}$	<p>1m</p> <p>1m</p> <p>1m</p>	<p>Working must be carried through to reach a final answer for the award of ONE mark.</p> <p>Do not award any marks if the error is in the place value, e.g. the omission of the zero when multiplying by tens:</p>
35	1 7/12	Up to	
36	3/14	2m	

Year 6 Maths

Reasoning Paper 1

- 1 Small boxes of chocolates contain 9 chocolates. How many boxes can be made from 630 chocolates?

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1 mark

- 2 Circle the calculation that gives the best approximation for **3.4 x 12.7**

34 x 127

3 x 12

3 x 13

3.5 x 12.5

--	--

1 mark

Year 6 Maths

3 Circle the **largest** amount in each pair

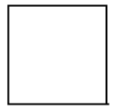
80cm – 1m

7.5kg – 7005g

13mm – 0.13cm

450g – 4.05kg

2m – 200mm



2 marks

4 Write **T** or **F** in each box to indicate whether the statements given are true or false.

$$\frac{1}{2} = 50\%$$

$$0.4 = \frac{2}{5}$$

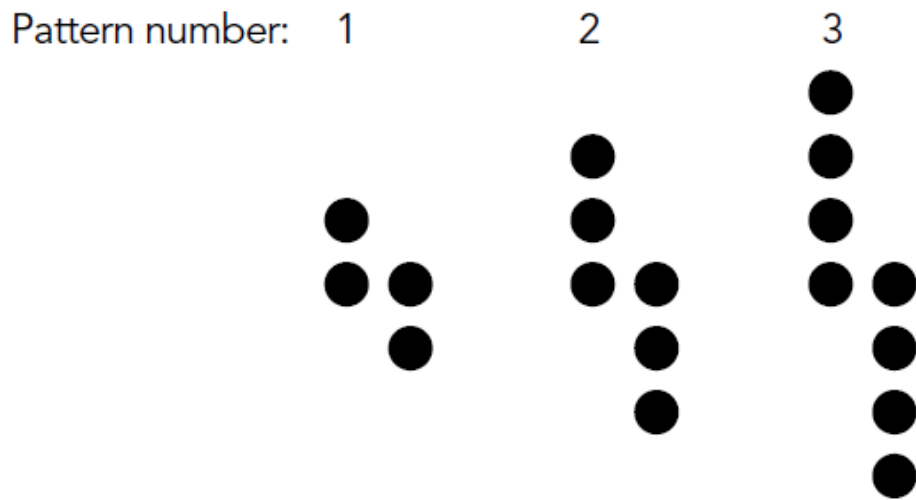
$$\frac{10}{80} = 25\%$$



1 mark

Year 6 Maths

5 A sequence is made using counters:



How many counters are needed to make the 6th pattern in the sequence?

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1 mark

Write a formula for the number of counters (c) needed to make the n th pattern in the sequence.

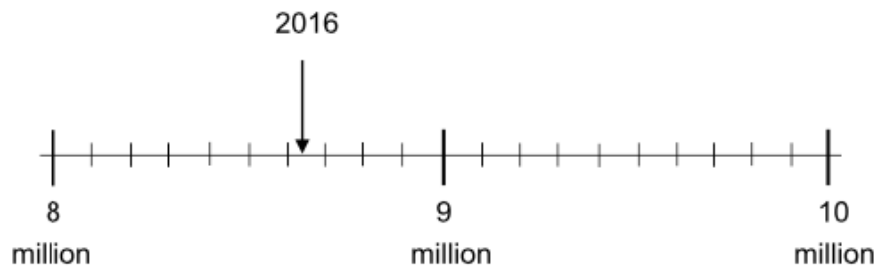
$c =$	
-------	--

1 mark

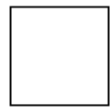
Year 6 Maths

6

The population of London in 2016 was 8.63 million.
This is marked on the scale:



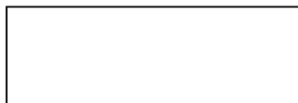
By 2025 the population of London is predicted to be 9.81 million. Draw an arrow to show the 2025 population on the scale above.



1 mark

7

Name these 3D shapes:



1 mark



1 mark

Year 6 Maths

8

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

1 mark

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

1 mark

9

This table shows the vehicles seen by Class 6R when they did a traffic survey:

	Monday	Tuesday	Wednesday	Thursday	Friday
Cars	32	27	38	44	41
Buses	2	1	3	3	4
Vans	5	2	4	4	4
Motorbikes	2	5	3	2	3

On which day were the **most** vehicles counted?

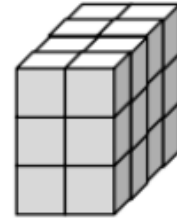
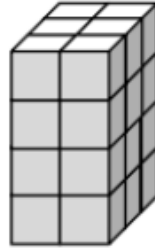
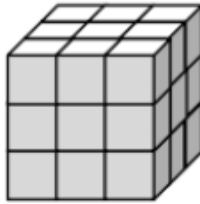
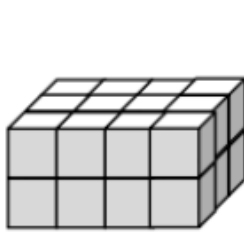
1 mark

Calculate the **mean** number of motorbikes seen.

1 mark

Year 6 Maths

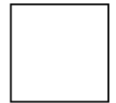
- 10 1cm^3 blocks have been used to make these shapes:



(not to scale)



Tick (✓) the shape that has the largest volume.



1 mark

What is the length of one edge of a cube that has a volume of 64cm^3 ?

cm



1 mark

- 11 Use 4 **different** digits to complete this multiplication calculation:

$$\square \times \square \times \square \times \square = 168$$

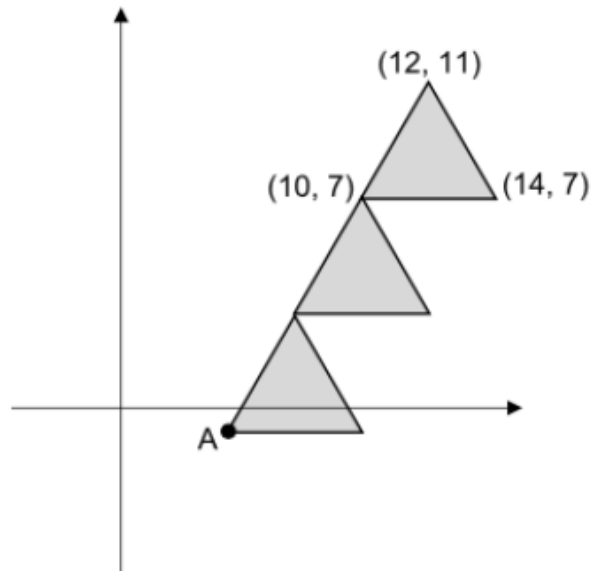


1 mark

Year 6 Maths

12

Three **identical** triangles have been drawn on a co-ordinate grid:



The co-ordinates of the vertices of one triangle have been given.

What are the co-ordinates of vertex A?

(,)

1 mark

If these three triangles were drawn on 1cm squared paper what would the area of one triangle be?

cm²

1 mark

Year 6 Maths

- 13 Round the numbers to nearest 100. Circle the **two** numbers that round to 1800

1089 1894 1846 1732 1765



1 mark

- | | |
|----|---------------|
| 14 | $-9.8 = 46.3$ |
|----|---------------|

7

1 mark

$$50 \div \quad = 1.25 \times 2$$

9

1 mark

- 15 3 feet is approximately 1 metre.
1 mile is approximately 1.6 kilometres.
Kate and Kenny each ran for 15 minutes.
Kenny ran 12,000 feet and Kate ran 2 miles.

How much further in kilometres did Kenny run than Kate? Show your method.

[illegible]

km

2 marks

Year 6 Maths

16

This is a recipe that makes 30 chocolate chip cookies:

- 150g butter
- 160g sugar
- 225g plain flour
- 1 large egg
- ½ teaspoon bicarbonate of soda
- 200g chocolate chips

Miss Watson wants to make **25** cookies for her class.

How much **plain flour** will she need?

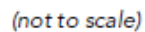
Show your method.

A blank grid of 20 columns and 10 rows, intended for drawing.

5

2 marks

17

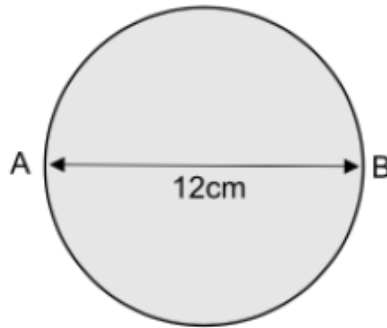


1 litre

2 marks

Year 6 Maths

18 This circle has a diameter of 12cm:



Complete these sentences:

The circle has a **radius** of

cm

1 mark

The distance around the circle from A to B is 18.85cm.

What length is the **circumference**?

cm

1 mark

Year 6 Maths

19

One square on this multiplication grid has been shaded. Shade any other squares that contain the same answer as this one.

x	2	4	8	3
3				
2				
12				
7				
6				



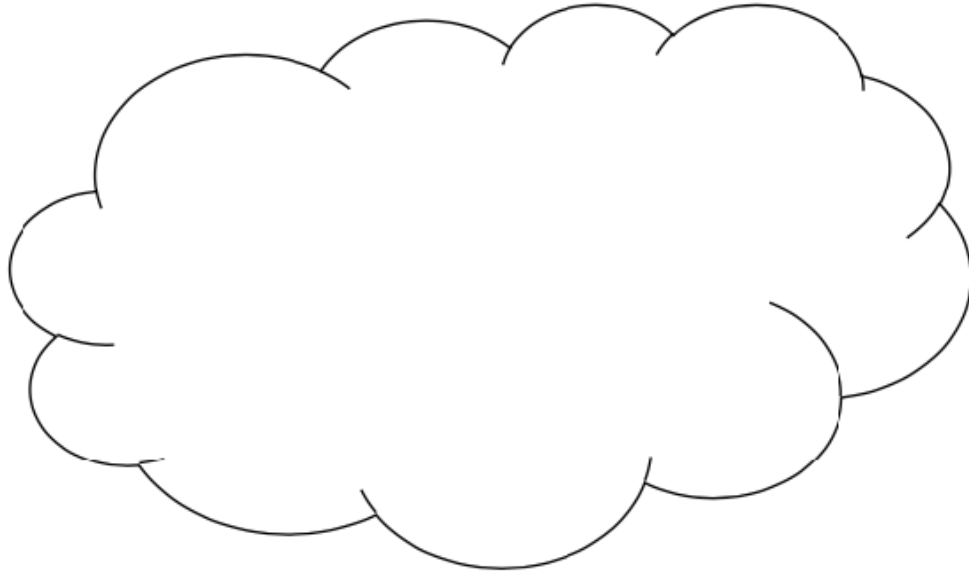
1 mark

Year 6 Maths

20

Sara says, 'There are 86,400 seconds in 1 day.'
Rani says, 'There are 24,000 seconds in 1 day.'

Explain how you know Sara is correct.



1 mark

Year 6 Maths

21

21 Harry, John and James jumped a total of 33m in a long jump competition.

Harry jumped 2.5 metres further than John.

James jumped 1 metre further than Harry.

How far did James jump?

Show your method.

[illegible]

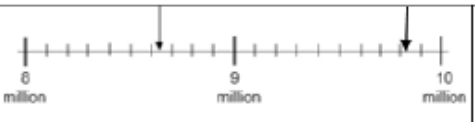
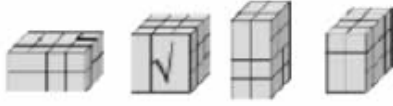
11

3 marks

Year 6 Maths

Reasoning Paper 1 Answers

Q	Required answer	Mark	Acceptable answer or additional guidance
1	70	1m	
2	3 x 13 circled	1m	
3	<p>Award TWO marks for all 5 correct:</p> <p style="text-align: center;"> 80cm 1m 7.5kg 7005g 13mm 0.13cm 450g 4.05kg 2m 200mm </p> <p>Award ONE mark for 3 or 4 correct answers.</p>	Up to 2m	Accept any clear indication of the correct answers.
4	T T F	1m	Accept any clear indication of true/false.
5	14 $c = 2n + 2$	1m	Accept $4n - 2(n-1)$

Q	Required answer	Mark	Acceptable answer or additional guidance
6		1m	Allow for slight inaccuracies
7	Cuboid Cylinder	1m	
8	$\frac{1}{8}$ $\frac{1}{12}$	1m 1m	
9	Thursday 3	1m 1m	
10	 <p>4cm</p>	1m 1m	Accept any clear indication of the correct answer.

Year 6 Maths

Q	Required answer	Mark	Acceptable answer or additional guidance
11	$2 \times 3 \times 4 \times 7$ OR $1 \times 3 \times 7 \times 8$ OR $1 \times 4 \times 6 \times 7$	1m	Digits can be in any order.
12	$(6, -1)$ 8cm^2	1m 1m	
13	1846 AND 1765	1m	Both answers required.
14	56.1 20	1m 1m	
15	Award TWO marks for the correct answer of 0.8km If the answer is incorrect, award ONE mark for evidence of an appropriate method with no more than one arithmetic error, e.g. Kenny: $12,000 \div 3 = 4000\text{m} = 4\text{km}$ Kate: $2 \times 1.6 = 3.2\text{km}$ $4\text{km} - 3.2\text{km} =$	Up to 2m	Award 1m for either 4000m/4km or 3.2km as evidence of correct conversion

Q	Required answer	Mark	Acceptable answer or additional guidance
16	Award TWO marks for the correct answer of 187.5g If the answer is incorrect, award ONE mark for evidence of an appropriate method with no more than one arithmetic error, e.g. $225\text{g} \div 6 = 37.5\text{g}$ $37.5\text{g} \times 5 =$ OR $225 \div 30 = 7.5\text{g}$ $7.5\text{g} \times 25 =$	Up to 2m	Also accept 0.1875kg
17	If the answer is incorrect, award ONE mark for evidence of an appropriate method with no more than one arithmetic error, e.g. $\pounds 1.05 \times 5 = \pounds 5.25$ $\pounds 0.65 \times 5 = \pounds 3.25$ Amount saved = $\pounds 2.00$	Up to 2m	

Year 6 Maths

Q	Required answer	Mark	Acceptable answer or additional guidance																														
18	6cm 37.7cm	1m 1m																															
19	<table border="1"><tr><td>x</td><td>2</td><td>4</td><td>8</td><td>3</td></tr><tr><td>3</td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td></tr><tr><td>12</td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td></tr></table>	x	2	4	8	3	3					2					12					7					6					1m 1m	Both answers required for the award of ONE mark. Do not award the mark if other squares are shaded.
x	2	4	8	3																													
3																																	
2																																	
12																																	
7																																	
6																																	
20	Award ONE mark for an explanation that shows that: There are $60 \times 60 = 3600$ seconds in 1 hour. There are 24 hours in 1 day. $24 \times 3600 = 86,400$ seconds		Do not accept vague, incomplete or incorrect explanations.																														

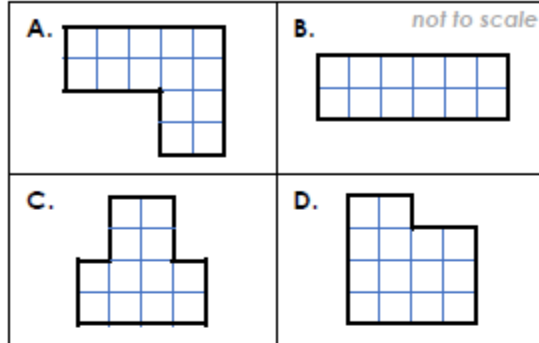
Q	Required answer	Mark	Acceptable answer or additional guidance
21	<p>Award THREE marks for the correct answer of 12.5m. If the answer is incorrect award TWO mark for evidence of an appropriate method e.g.</p> <p>John = xm Harry = $x + 2.5$m James = $x + 2.5$m + 1m $33m = x + (x+2.5) + (x+2.5+1)$ $33m = 3x + 6$ $33m - 6 = 3x$ $27 = 3x$ $9 = x = \text{John's jump}$ So James = $9 + 3.5 = 12.5$m</p>	Up to 2m	<p>Accept for ONE mark evidence of correct use of algebra, e.g:</p> <p>John = xm Harry = $x + 2.5$m James = $x + 2.5$m + 1m OR Accept for one mark a sensible trial and improvement method giving an incorrect answer.</p>

Year 6 Maths

Perimeter, Area and Volume

Shapes – Same Area

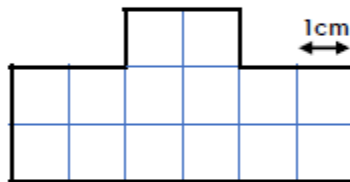
1a. Circle the shapes with an area of 12cm^2 .



= 1cm^2

VF

2a. Draw a different rectilinear shape to the one below with the same area.



not to scale

VF

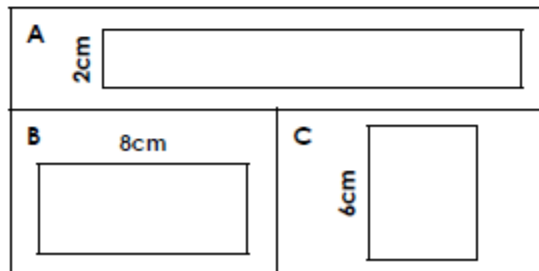
3a. Using 1cm^2 squared paper, draw 2 different rectangles with an area of 18cm^2 .

Label the lengths of each side.



VF

4a. All of these rectangles have an area of 24cm^2 .



Complete the missing lengths.



not to scale

VF

Shapes – Same Area

1a. Warren says,



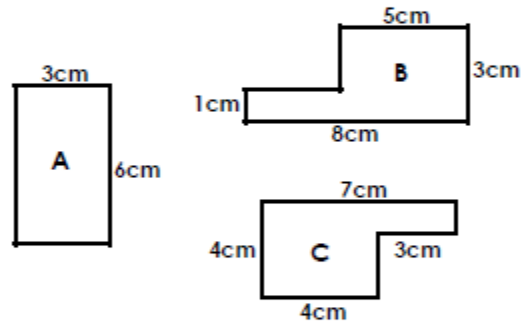
I can draw a four-sided and a six-sided rectilinear shape with an area of 12cm^2 .

Draw two shapes to prove that Warren is correct.



PS

2a. True or false? All of these shapes have the same area.



Explain your answer.



not to scale

R

3a. Zak is experimenting with the area of rectangles.

He says,

"If a rectangle has an area of 24cm^2 , the length of it could be 6cm ."

Is he correct? Explain why.

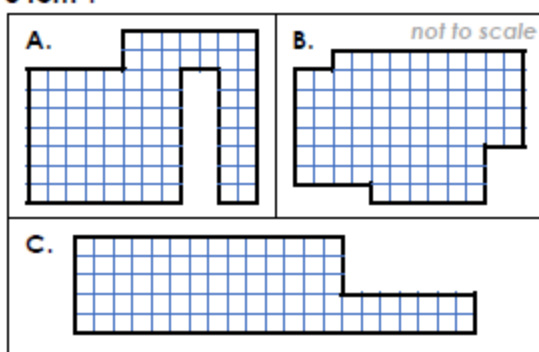


R

Year 6 Maths

Shapes – Same Area

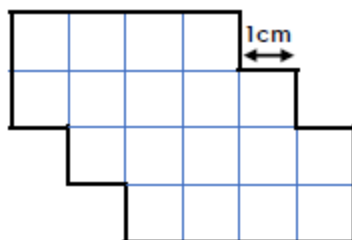
5a. Circle the shapes with an area of 84cm^2 .



$\square = 1\text{cm}^2$

VF

6a. Draw a different rectilinear shape to the one below with the same area.



not to scale

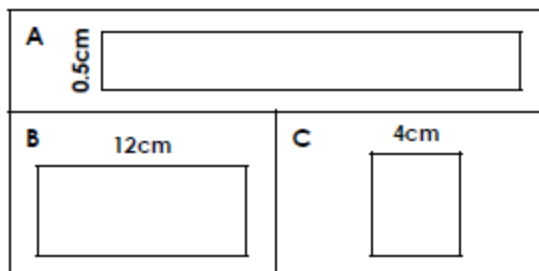
VF

7a. Using 1cm^2 squared paper, draw 3 different rectangles with a combined area of 24cm^2 . One of your rectangles must have a side measurement ending in .5cm.



VF

8a. All of these rectangles have an area of 36cm^2 .



Complete the missing lengths.



not to scale

VF

4a. Suzi says,



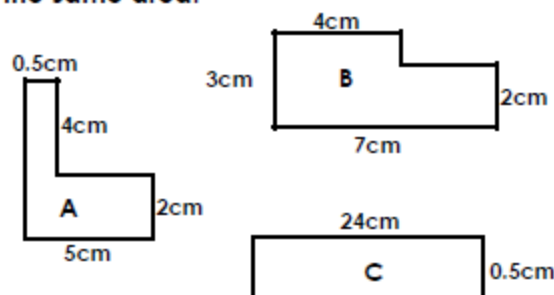
I can draw a six-sided and an eight-sided rectilinear shape with an area of 18cm^2 .

Draw two shapes to prove that Suzi is correct. Your shapes must include some half squares.



PS

5a. True or false? All of these shapes have the same area.



Explain your answer.



not to scale

R

6a. Taylor is experimenting with the area of rectilinear shapes.

She says,

"If a shape has an area of 19cm^2 , the length of it could be 38cm ."

Is she correct? Explain why.

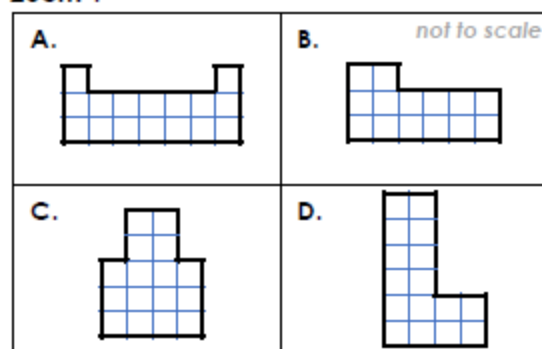


R

Year 6 Maths

Shapes – Same Area

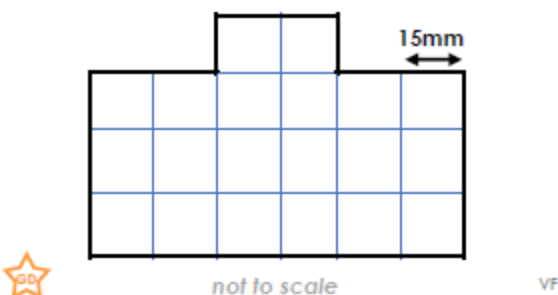
9a. Circle the shapes with an area of 20cm^2 .



$\square = 1.25\text{cm}^2$

VF

10a. Draw a different rectilinear shape to the one below with the same area.



VF

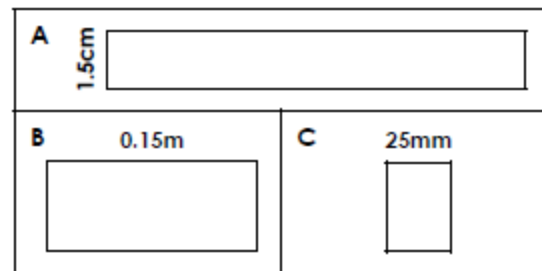
11a. Using 1cm^2 squared paper, draw a composite rectilinear shape with an area of 36cm^2 . Include a length of 15mm .

Label the lengths of each side so that a conversion takes place.



VF

12a. All of these rectangles have an area of 75cm^2 . Complete the missing lengths.



Complete the missing lengths.



not to scale

VF

Shapes – Same Area

7a. Reilly says,



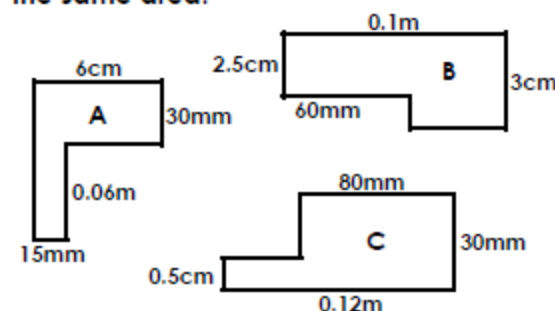
I can draw a six-sided and an eight-sided rectilinear shape with an area of 26.5cm^2 .

Draw two shapes to prove that Reilly is correct. Your shapes must include some half or quarter squares.



PS

8a. True or false? All of these shapes have the same area.



Explain your answer.



not to scale

R

9a. Nate is experimenting with the area of rectilinear shapes.

He says,

"If a shape has an area of 36cm^2 , the length of it could be 65mm ."

Is he correct? Explain why.



R

Year 6 Maths

Answers:

Varied Fluency Shapes – Same Area

Developing

1a. B and C

2a. Any rectilinear shape with an area of 14cm^2 .

3a. Any rectangles with an area of 18cm^2 .
For example: $1\text{cm} \times 18\text{cm}$; $2\text{cm} \times 9\text{cm}$; $3\text{cm} \times 6\text{cm}$.

4a. A. 12cm ; B. 3cm ; C. 4cm

Expected

5a. A, B and C

6a. Any rectilinear shape with an area of 18cm^2 .

7a. Any combination of 3 rectangles with a combined area of 24cm^2 and where at least one side includes a half measurement. For example: $1.5\text{cm} \times 16\text{cm}$.

8a. A. 72cm ; B. 3cm ; C. 9cm

Greater Depth

9a. A, C and D

10a. Any rectilinear shape with an area of 3cm^2 (when square measures 15mm).

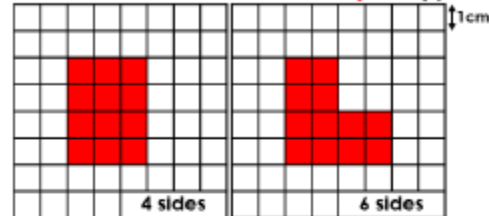
11a. Any composite rectilinear shapes with an area of 36cm^2 , where a conversion has taken place and where one side measures 15mm . For example: $6\text{cm} \times 15\text{mm} + 30\text{mm} \times 9\text{cm} = 36\text{cm}^2$.

12a. A. 50cm ; B. 5cm ; C. 30cm

Reasoning and Problem Solving Shapes – Same Area

Developing

1a. Various answers, for example:

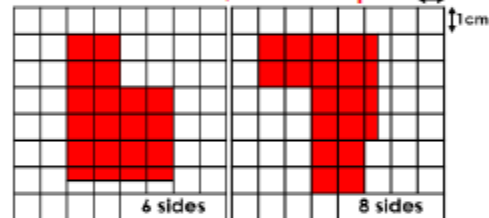


2a. False. Shape A and B have an area of 18cm^2 , but shape C has an area of 19cm^2 .

3a. Yes, he is correct. A shape with a length of 6cm and a width of 4cm will have an area of 24cm^2 .

Expected

4a. Various answers, for example:

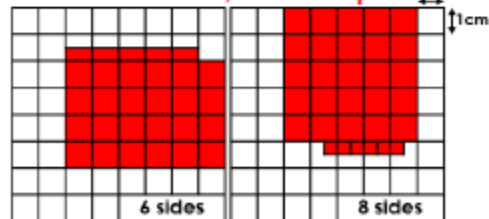


5a. False. Shape A and C have an area of 12cm^2 , but shape B has an area of 18cm^2 .

6a. Yes, she is correct. A shape with a length of 38cm and a width of 0.5cm would have an area of 19cm^2 .

Greater Depth

7a. Various answers, for example:



8a. False. Shape A and B have an area of 27cm^2 , but shape C has an area of 26cm^2 .

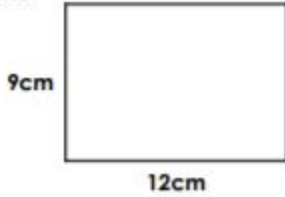
9a. Yes, he is correct. A compound shape containing a rectangle 65mm by 40mm and a second rectangle, 5cm by 2cm , will have an area of 36cm^2 .

Year 6 Maths

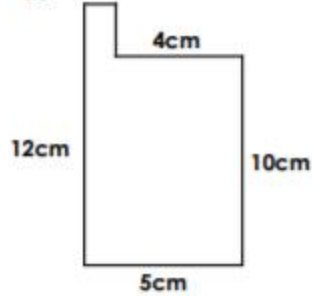
Area and Perimeter

1. Circle the shape has a different total perimeter to the others.

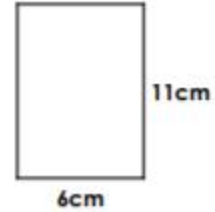
A.



B.



C.

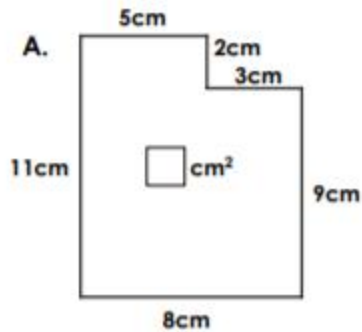


Not to scale

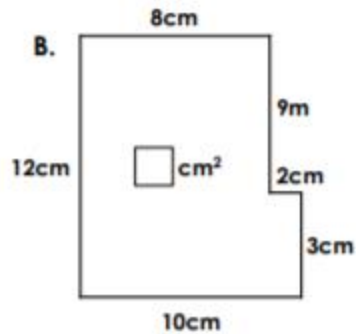
VF
HW/Ext

2. Calculate the area of the shapes below.

A.



B.



Not to scale

VF
HW/Ext

3. The shape below has an area greater than 50m^2 .



Work out the possible perimeter of the shape. Convince me.



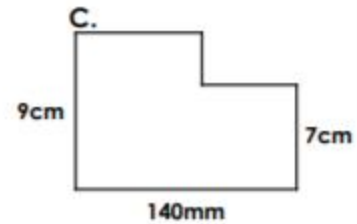
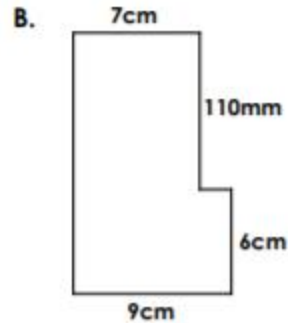
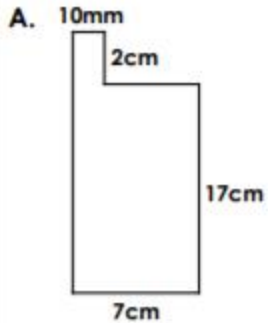
Not to scale

RPS
HW/Ext

Year 6 Maths

Area and Perimeter

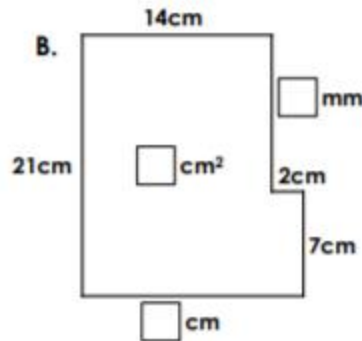
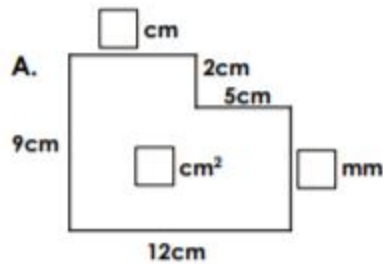
4. Circle the shape has a different total perimeter to the others.



Not to scale

VF
HW/Ext

5. Using the formulas $p = 2l + 2w$ and $a = w \times l$, find the missing values of the shapes below.



Not to scale

VF
HW/Ext

6. The shape below has an area greater than 100m^2 .



Work out the possible perimeter of the shape. Convince me.



Not to scale

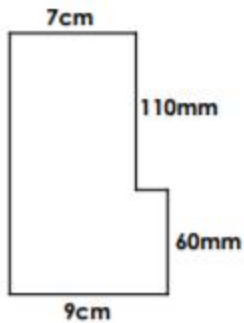
RPS
HW/Ext

Year 6 Maths

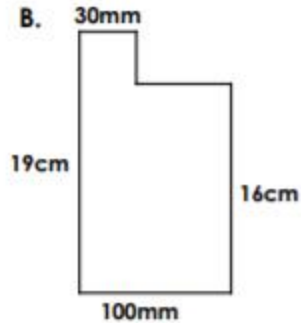
Area and Perimeter

7. Circle the shape has a different total perimeter to the others.

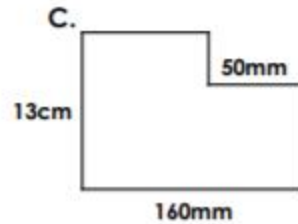
A.



B.



C.

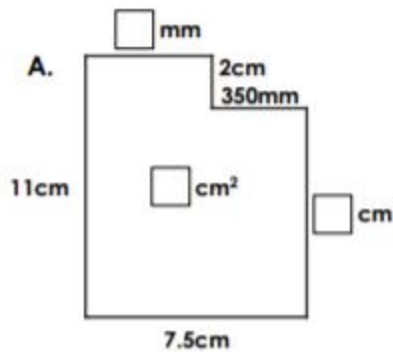


Not to scale

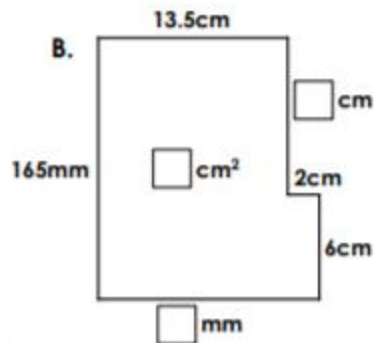
VF
HW/Ext

8. Using the formulas $p = 2l + 2w$ and $a = w \times l$, find the missing values of the shapes below.

A.



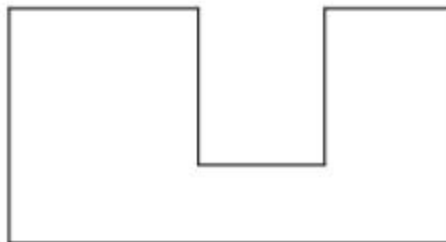
B.



Not to scale

VF
HW/Ext

9. The shape below has an area that is a decimal number greater than 80m^2 .



Work out the possible perimeter of the shape. Convince me.



Not to scale

RPS
HW/Ext

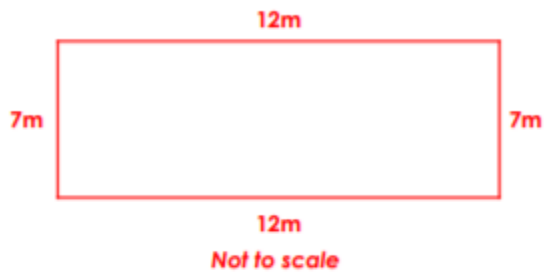
Year 6 Maths

Answers:

Area and Perimeter

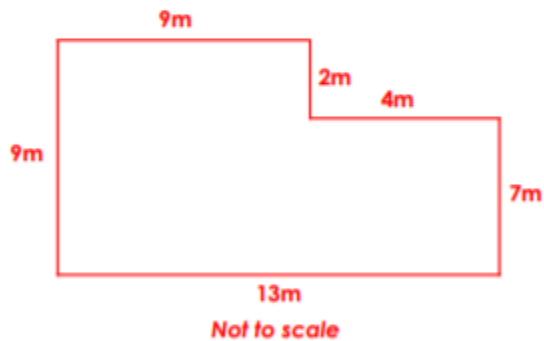
Developing

1. **A**
2. **A. 82cm^2 ; B. 102cm^2**
3. **Various possible answers, for example:**
The total perimeter could be 38m as shown below. This would result in an area of 84m^2 .



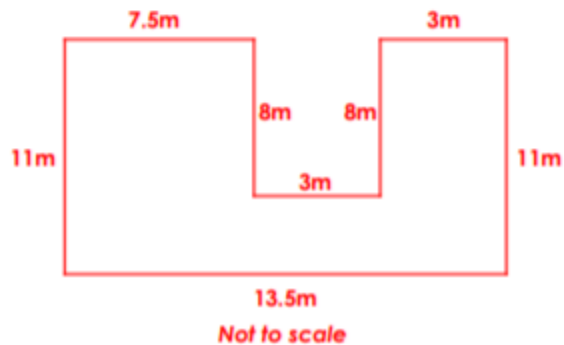
Expected

4. **C**
5. **A. 7cm, 70mm, 98cm^2 ; B. 16cm, 140mm, 308cm^2**
6. **Various possible answers, for example:**
The total perimeter could be 44m as shown below. This would result in an area of 109m^2 .



Greater Depth

7. **B**
8. **A. 40mm, 9cm, 75.5cm^2 ; B. 115mm, 10.5cm, 234.75cm^2**
9. **Various possible answers, for example:**
The total perimeter could be 65m as shown below. This would result in an area of 124.5m^2 .



Year 6 Maths

Area of a Triangle

Area of a Triangle 2

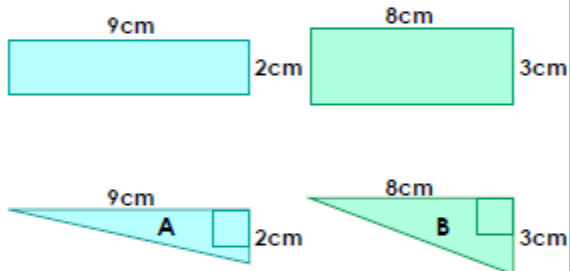
1a. Use the area of the rectangle to calculate the area of the triangle.



not to scale

VF

2a. Use the rectangles to work out the areas of the triangles below.



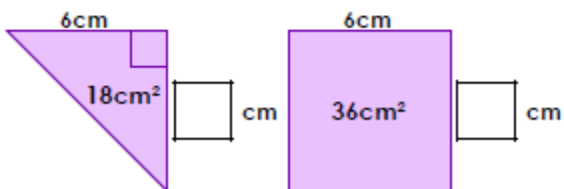
Circle the triangle that has the larger area.



not to scale

VF

3a. The areas of the triangle and square are written in the centre of the shapes.



Use your knowledge of area to find the missing value.



not to scale

VF

Area of a Triangle 2

1a. Maeve is thinking of a triangle.



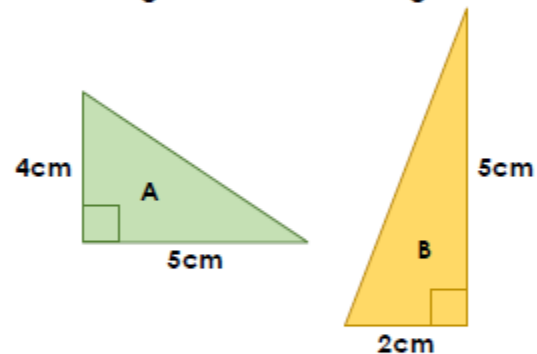
My triangle has an area greater than 20cm^2 but less than 30cm^2 . Its height is twice as long as its base.

Draw and label Maeve's triangle. Find the area.



PS

2a. Mia thinks the area of triangle A is twice as big as the area of triangle B.



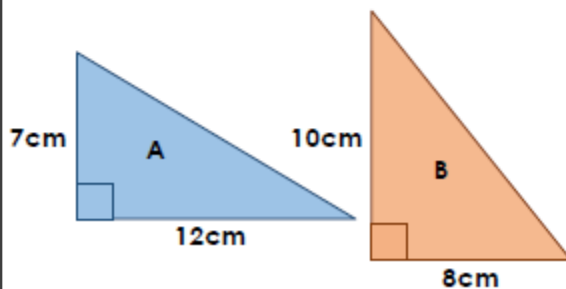
Is Mia correct? Prove it.



not to scale

R

3a. Calculate the difference between the area of these 2 triangles.



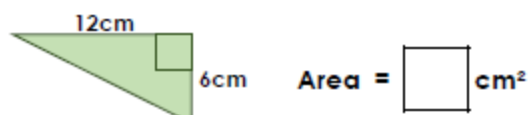
not to scale

PS

Year 6 Maths

Area of a Triangle 2

4a. Use the area of the rectangle to calculate the area of the triangle.

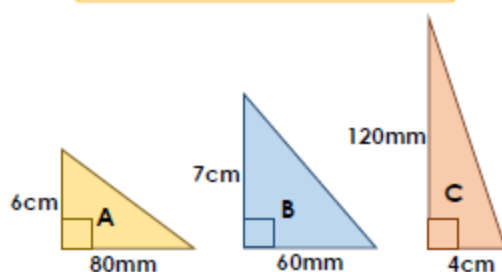


not to scale

VF

5a. Calculate the areas of the triangles below and circle the triangle that has a different area.

$$\text{area} = \frac{\text{base} \times \text{height}}{2}$$

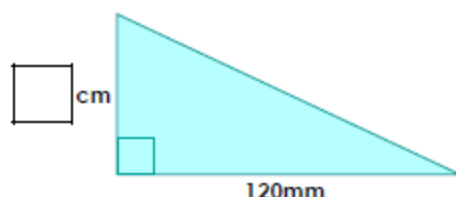


not to scale

VF

6a. The area of the triangle is 54cm^2 . Using the formula, find the length of the missing side.

$$\text{area} = \frac{\text{base} \times \text{height}}{2}$$



Write your answer in cm.



not to scale

VF

Area of a Triangle 2

4a. Jensen is thinking of a triangle.



My triangle has an area greater than 600cm^2 but less than 750cm^2 . Its base is 50cm longer than its height.

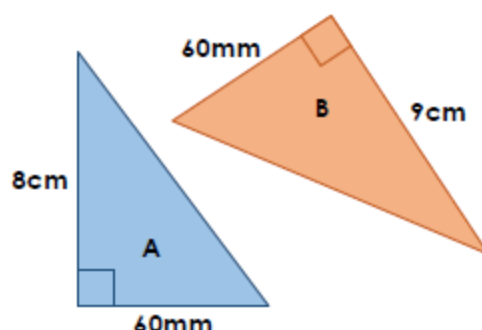
$$\text{area} = \frac{\text{base} \times \text{height}}{2}$$

Draw and label Jensen's triangle. Find the area using the formula above.



PS

5a. Abby thinks the area of triangle A is smaller than the area of triangle B.



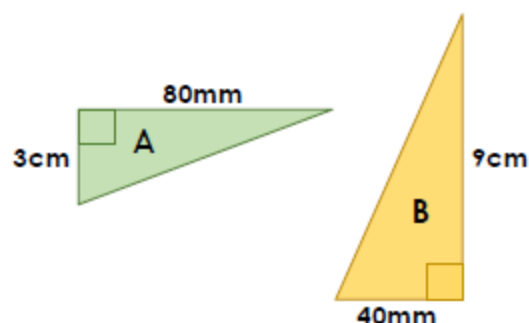
Is Abby correct? Use a formula to prove it.



not to scale

R

6a. Calculate the difference between the area of these 2 triangles, using the correct formula.



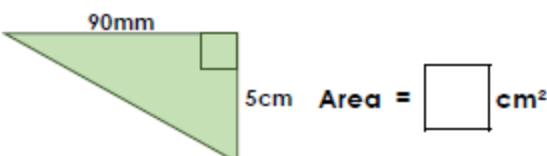
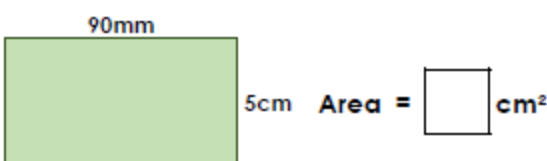
not to scale

PS

Year 6 Maths

Area of a Triangle 2

7a. Use the area of the rectangle to calculate the area of the triangle.



not to scale

VF

Area of a Triangle 2

7a. Sadia is thinking of a triangle.



My triangle has an area greater than 0.6m^2 but less than $6,100\text{cm}^2$. Its height is equal to its base.

$$\text{area} = \frac{\text{base} \times \text{height}}{2}$$

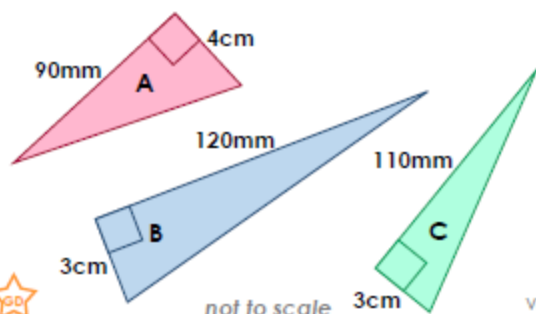
Draw and label Sadia's triangle in cm. Find the area using the formula above.



PS

8a. Calculate the areas of the triangles below and circle the triangle that has a different area.

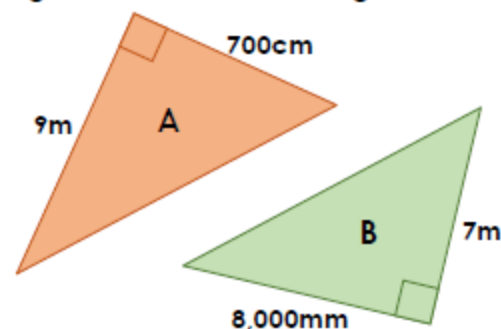
$$\text{area} = \frac{\text{base} \times \text{height}}{2}$$



not to scale

VF

8a. Cory thinks the area of triangle B is larger than the area of triangle A.



Is Cory correct? Use a formula to prove it.

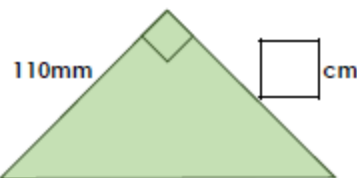


not to scale

R

9a. The area of the triangle is 60.5cm^2 . Using the formula, find the length of the missing side.

$$\text{area} = \frac{\text{base} \times \text{height}}{2}$$



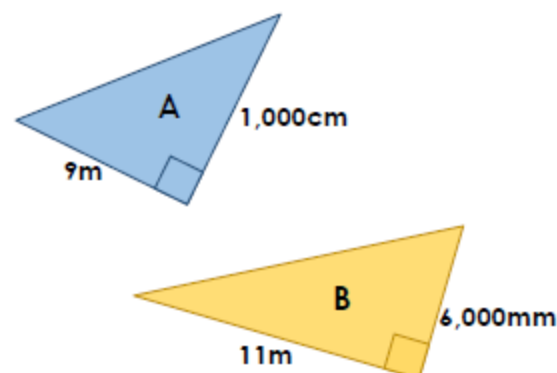
Write your answer in cm.



not to scale

VF

9a. Calculate the difference between the area of these 2 triangles.



not to scale

PS

Year 6 Maths

Answers:

Varied Fluency Area of a Triangle 2

Developing

- 1a. Rectangle = 24cm^2 ; triangle = 12cm^2
2a. A = 9cm^2 ; B = 12cm^2 ; B has the larger area.
3a. 6cm

Expected

- 4a. Rectangle = 72cm^2 ; triangle = 36cm^2
5a. A = 24cm^2 ; B = 21cm^2 ; C = 24cm^2 ; B has a different area.
6a. 9cm

Greater Depth

- 7a. Rectangle = 45cm^2 ; triangle = 22.5cm^2
8a. A = 18cm^2 ; B = 18cm^2 ; C = 16.5cm^2 ; C has a different area.
9a. 11cm

Reasoning and Problem Solving Area of a Triangle 2

Developing

- 1a. Example answer: height = 10cm; base = 5cm; area = 25cm^2
2a. Mia is correct because A = 10cm^2 and B = 5cm^2 . A is twice as big as B.
3a. A = $7\text{cm} \times 12\text{cm} = 84\text{cm}^2$, $84\text{cm}^2 \div 2 = 42\text{cm}^2$
B = $10\text{cm} \times 8\text{cm} = 80\text{cm}^2$, $80\text{cm}^2 \div 2 = 40\text{cm}^2$
 $42\text{cm}^2 - 40\text{cm}^2 = 2\text{cm}^2$

Expected

- 4a. Various answers, for example: height = 70cm; base = 20cm; area = 700cm^2
5a. Abby is correct because A = 24cm^2 and B = 27cm^2 . 27cm^2 is larger than 24cm^2 .
6a. A = $3\text{cm} \times 8\text{cm} = 24\text{cm}^2$, $24\text{cm}^2 \div 2 = 12\text{cm}^2$
B = $4\text{cm} \times 9\text{cm} = 36\text{cm}^2$, $36\text{cm}^2 \div 2 = 18\text{cm}^2$
 $18\text{cm}^2 - 12\text{cm}^2 = 6\text{cm}^2$

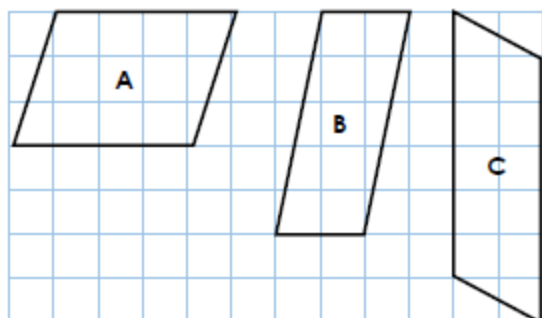
Greater Depth

- 7a. Various answers, for example: height = 110cm; base = 110cm; area = $6,050\text{cm}^2$
8a. Cory is incorrect because A = 31.5m^2 and B = 28m^2 . 31.5m^2 is larger than 30m^2 .
9a. A = $9\text{m} \times 10\text{m} = 90\text{m}^2$, $90\text{m}^2 \div 2 = 45\text{m}^2$
B = $11\text{m} \times 6\text{m} = 66\text{m}^2$, $66\text{m}^2 \div 2 = 33\text{m}^2$
 $45\text{m}^2 - 33\text{m}^2 = 12\text{m}^2$

Year 6 Maths

Area of a Parallelogram

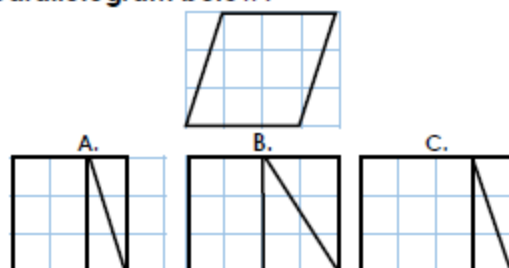
1a. Which parallelograms have an area of 12cm^2 ? $\square = 1\text{cm}^2$



Not to scale

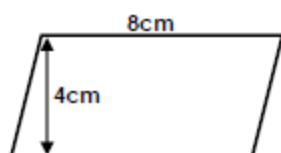
VF

2a. Which group of shapes make up the parallelogram below?



VF

3a. Use the formula: base \times perpendicular height to calculate the area of the shape.



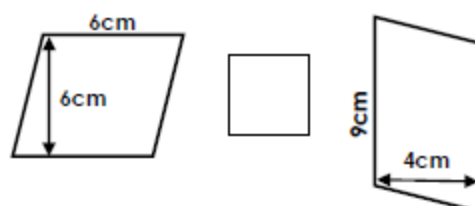
 \times = cm^2



Not to scale

VF

4a. Calculate the area of the shapes and complete the comparison statement.

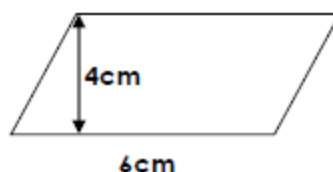


Not to scale

VF

Area of a Parallelogram

1a. Keon says that half the area of the parallelogram below is 24cm^2 .



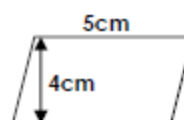
Use the formula base \times perpendicular height to prove whether Keon is correct.



Not to scale

R

2a. Connor is tiling part of a swimming pool. The tiles are parallelograms.



The area he wants to cover is $400\text{cm} \times 200\text{cm}$.

The area needs to be completely covered. How many tiles will he need?

Show your working.



Not to scale

PS

3a. Sanaa has drawn a parallelogram.

She says,



The area of my parallelogram is 21cm^2 and the base is 7cm , so the perpendicular height must be 2cm .

Is she correct? Explain your answer.



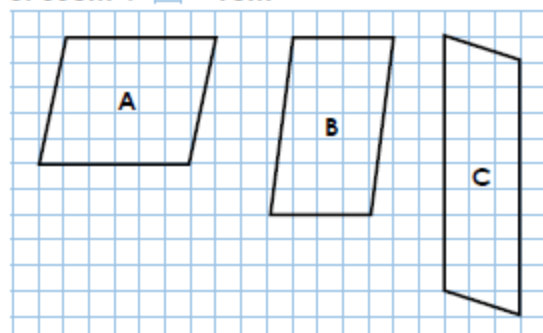
Not to scale

R

Year 6 Maths

Area of a Parallelogram

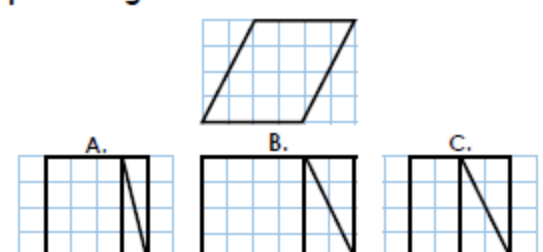
5a. Which parallelograms have an area of 30cm^2 ? $\square = 1\text{cm}^2$



Not to scale

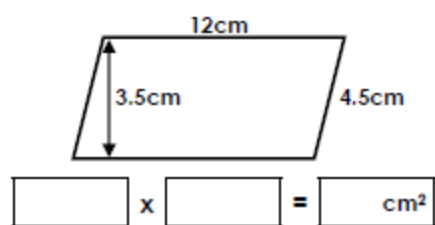
VF

6a. Which group of shapes make up the parallelogram below?



VF

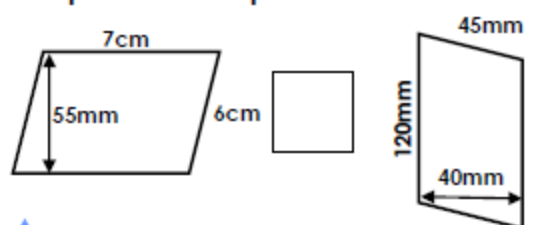
7a. Use the formula: base \times perpendicular height to calculate the area of the shape.



Not to scale

VF

8a. Calculate the area of the shapes and complete the comparison statement.

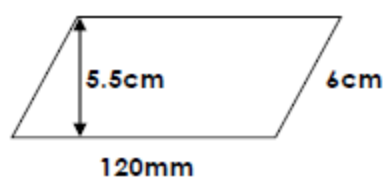


Not to scale

VF

Area of a Parallelogram

4a. Daniel says that half the area of the parallelogram below is 60cm^2 .



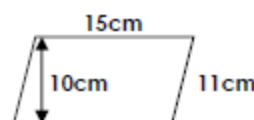
Use the formula base \times perpendicular height to prove whether Daniel is correct.



Not to scale

R

5a. Clive is paving part of his garden. The paving stones are parallelograms.



The area he wants to cover is $400\text{cm} \times 150\text{cm}$.

The area needs to be completely covered. How many paving stones will he need?

Show your working.



Not to scale

PS

6a. Jenni has drawn a parallelogram.

She says,



The area of my parallelogram is 60cm^2 and the base is 240mm , so the perpendicular height must be 2cm .

Is she correct? Explain your answer.



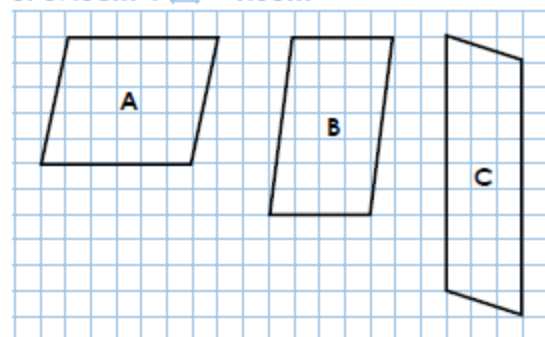
Not to scale

R

Year 6 Maths

Area of a Parallelogram

9a. Which parallelograms have an area of 67.5cm^2 ? $\square = 1.5\text{cm}$

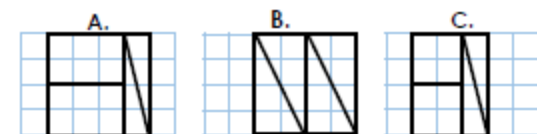


Not to scale

VF

10a. Tick the set of shapes which make a parallelogram with an area of 27cm^2 .

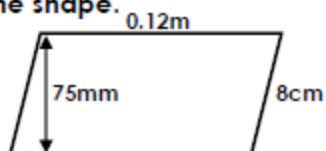
$\square = 1.5\text{cm}$



Not to scale

VF

11a. Use the formula: base \times perpendicular height to calculate the area of the shape.



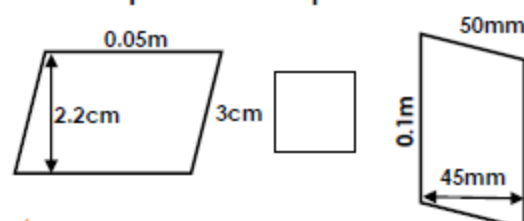
$\square \times \square = \square \text{cm}^2$



Not to scale

VF

12a. Calculate the area of the shapes and complete the comparison statement.

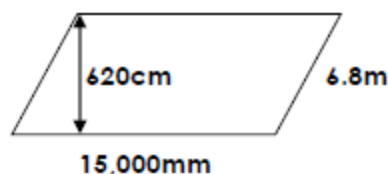


Not to scale

VF

Area of a Parallelogram

7a. Judah says that half the area of the parallelogram below is 46m^2 .



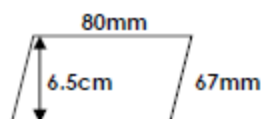
Use the formula base \times perpendicular height to prove whether Judah is correct.



Not to scale

R

8a. Ivy is creating part of a patchwork quilt. The patches are parallelograms.



The area she wants to cover is $8\text{m} \times 0.13\text{m}$.

The area needs to be completely covered. How many patches will she need?

Show your working.



Not to scale

PS

9a. Lilah has drawn a parallelogram.

She says,



The area of my parallelogram is 75cm^2 and the base is 0.15m , so the perpendicular height must be 500mm .

Is she correct? Explain your answer.



Not to scale

R

Year 6 Maths

Answers:

Varied Fluency Area of a Parallelogram

Developing

1a. **A and C**

2a. **A**

3a. $8\text{cm} \times 4\text{cm} = 32\text{cm}^2$

4a. $36\text{cm}^2 = 36\text{cm}^2$

Expected

5a. **A and C**

6a. **C**

7a. $12\text{cm} \times 3.5\text{cm} = 42\text{cm}^2$

8a. $38.5\text{cm}^2 < 48\text{cm}^2$

Greater Depth

9a. **A and C**

10a. **C**

11a. $12\text{cm} \times 7.5\text{cm} = 90\text{cm}^2$

12a. $11\text{cm}^2 < 45\text{cm}^2$

Reasoning and Problem Solving Area of a Parallelogram

Developing

1a. No; the area of the parallelogram is $6\text{cm} \times 4\text{cm} = 24\text{cm}^2$, so half the area of the parallelogram is $24\text{cm}^2 \div 2 = 12\text{cm}^2$, not 24cm^2 .

2a. 4,000 tiles; the area of each tile is 20cm^2 ($5\text{cm} \times 4\text{cm}$) and the area of the pool he wants to tile is $80,000\text{cm}^2$ ($400\text{cm} \times 200\text{cm}$). $80,000\text{cm}^2 \div 20\text{cm}^2 = 4,000$.

3a. No; $21\text{cm}^2 \div 7\text{cm} = 3\text{cm}$, not 2cm .

Expected

4a. No; the area of the parallelogram is $12\text{cm} \times 5.5\text{cm} = 66\text{cm}^2$, so half the area of the parallelogram is $66\text{cm}^2 \div 2 = 33\text{cm}^2$, not 60cm^2 .

5a. 400 paving stones; the area of each stone is 150cm^2 ($15\text{cm} \times 10\text{cm}$) and the area of the garden he wants to cover is $60,000\text{cm}^2$ ($400\text{cm} \times 150\text{cm}$). $60,000\text{cm}^2 \div 150\text{cm}^2 = 400$.

6a. No; $60\text{cm}^2 \div 24\text{cm} = 2.5\text{cm}$, not 2cm .

Greater Depth

7a. No; the area of the parallelogram is $15\text{m} \times 6.2\text{m} = 93\text{m}^2$, so half the area of the parallelogram is $93\text{m}^2 \div 2 = 46.5\text{m}^2$, not 46m^2 .

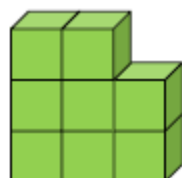
8a. 200 patches; the area of each patch is 52cm^2 ($8\text{cm} \times 6.5\text{cm}$) and the area of the quilt she is creating is $10,400\text{cm}^2$ ($800\text{cm} \times 13\text{cm}$). $10,400\text{cm}^2 \div 52\text{cm}^2 = 200$.

9a. No; $75\text{cm} \div 15\text{cm} = 5\text{cm}$ (which is 50mm , not 500mm).

Year 6 Maths

Volume – Counting Cubes

1a. Match the shape to its volume in cm^3 .



8cm^3

7cm^3

12cm^3



Hint: each cube has a volume of 1cm^3 . VF

2a. Write a volume to complete the comparison statement below.



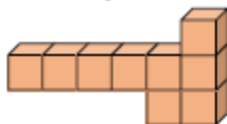
<

cm^3



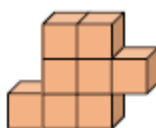
Hint: each cube has a volume of 1cm^3 . VF

3a. Look at the shape below.

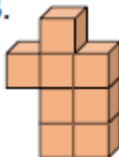


Which of these shapes has the same volume in cubic units?

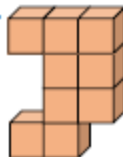
A.



B.

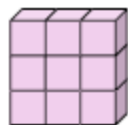


C.

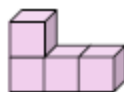


Hint: each cube has a volume of 1cm^3 . VF

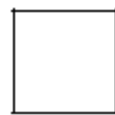
4a. If the shapes below were combined, what would their volume be altogether?



+



=

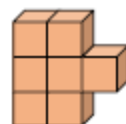


Hint: each cube has a volume of 1cm^3 . VF

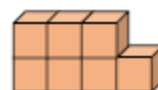
Volume – Counting Cubes

1a. Henry is building some shapes. He thinks that Shape B has the greatest volume.

A.



B.



Is he correct? Explain your answer.

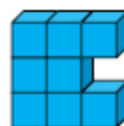


Each cube has a volume of 1cm^3 . R

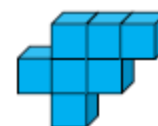
2a. Harriet has 7 cubes in total.

Which of the shapes below could she create?

A.



B.



Each cube has a volume of 1cm^3 . PS

3a. Find the odd one out.

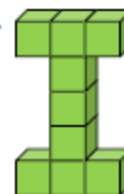
A.



B.



C.



Explain your answer.

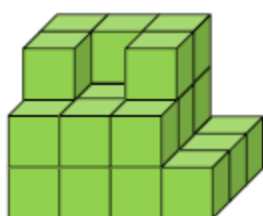


Each cube has a volume of 1cm^3 . R

Year 6 Maths

Volume – Counting Cubes

5a. Match the shape to its volume in cm^3 .



18 cm^3

26 cm^3

22 cm^3



Hint: each cube has a volume of 1cm^3 . VF

6a. Write a volume to complete the comparison statement below.



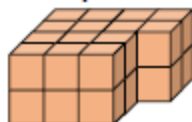
<

cm^3



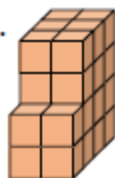
Hint: each cube has a volume of 1cm^3 . VF

7a. Look at the shape below.

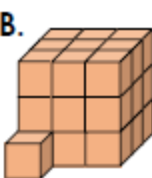


Which of these shapes has the same volume in cubic units?

A.



B.

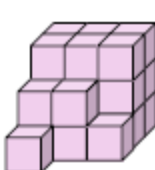


C.

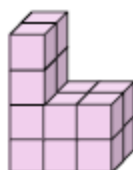


Hint: each cube has a volume of 1cm^3 . VF

8a. If the shapes below were combined, what would their volume be altogether?



+



=

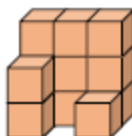


Hint: each cube has a volume of 1cm^3 . VF

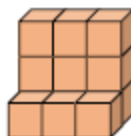
Volume – Counting Cubes

4a. Kian is building some shapes. He thinks that all of the shapes below have the same volume.

A.



B.



C.



Is he correct? Explain your answer.

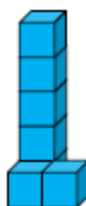


Each cube has a volume of 1cm^3 . R

5a. Tilly has 24 cubes.

Which combinations from the shapes below could she create if she used all her cubes?

A.



B.



C.



Each cube has a volume of 1cm^3 . PS

6a. Find the odd one out.

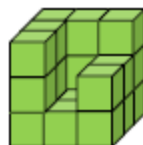
A.



B.



C.



Explain your answer.



Each cube has a volume of 1cm^3 . R

Year 6 Maths

Volume – Counting Cubes

9a. Match the shape to its volume in cm^3 .



23 cm^3

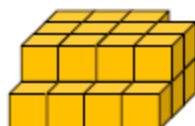
21 cm^3

20 cm^3



Hint: each cube has a volume of 1cm^3 . VF

10a. Write a volume to complete the comparison statement below.



<

cm^3



Hint: each cube has a volume of 3cm^3 . VF

11a. Look at the shape below.



Which of these shapes has the same volume in cubic units?

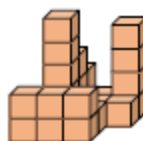
A.



B.

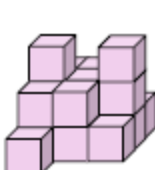


C.

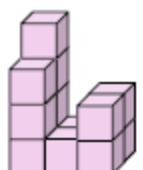


Hint: each cube has a volume of 1cm^3 . VF

12a. If the shapes below were combined, what would their volume be altogether?



+



=

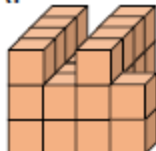


Hint: each cube has a volume of 3cm^3 . VF

Volume – Counting Cubes

7a. Orla is building some shapes. She thinks that all of the shapes below have a volume $< 100\text{cm}^3$.

A.



B.



C.



Is she correct? Explain your answer.



Each cube has a volume of 3cm^3 . R

8a. Charlotte has cubes with a total volume $< 100\text{cm}^3$.

Which combinations from the shapes below could she create?

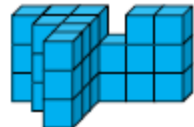
A.



B.



C.



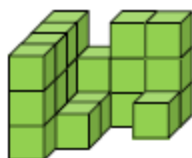
D.



Each cube has a volume of 2cm^3 . PS

9a. Find the odd one out.

A.



B.



C.



D.



Explain your answer.



Each cube has a volume of 3cm^3 . R

Year 6 Maths

Answers:

Varied Fluency Volume – Counting Cubes

Developing

- 1a. 8cm^3
2a. Acceptable answers: 7cm^3 or more.
3a. C
4a. $9\text{cm}^3 + 4\text{cm}^3 = 13\text{cm}^3$

Expected

- 5a. 26cm^3
6a. Acceptable answers: 19cm^3 or more.
7a. A and B
8a. $24\text{cm}^3 + 16\text{cm}^3 = 40\text{cm}^3$

Greater Depth

- 9a. 21cm^3
10a. Acceptable answers: 79cm^3 or more.
11a. B
12a. $57\text{cm}^3 + 39\text{cm}^3 = 96\text{cm}^3$

Reasoning and Problem Solving Volume – Counting Cubes

Developing

- 1a. Henry is incorrect; both shapes have a volume of 7cm^3 , so Shape B doesn't have the greatest volume.
2a. B.
3a. B is the odd one out; it has a volume of 8cm^3 . A and C both have a volume of 9cm^3 .

Expected

- 4a. Kian is incorrect; although Shape A and B both have a volume of 12cm^3 , Shape C has a volume of 11cm^3 , so they do not all have the same volume.
5a. $A = 7\text{cm}^3$, $B = 17\text{cm}^3$, $C = 7\text{cm}^3$. Tilly can create the following combinations: $A + B$ or $A + C$.
6a. B is the odd one out; it has a volume of 19cm^3 . A and C both have a volume of 21cm^3 .

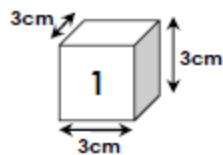
Greater Depth

- 7a. Orla is incorrect; although Shape B and C both have a volume $< 100\text{cm}^3$ (Shape B = 72cm^3 , Shape C = 48cm^3), Shape C has a volume of 102cm^3 , so they do not all have the volume $< 100\text{cm}^3$.
8a. $A = 46\text{cm}^3$, $B = 42\text{cm}^3$, $C = 58\text{cm}^3$, $D = 36\text{cm}^3$. Charlotte can create the following combinations: $A + B$; $A + D$; $B + D$; $C + D$.
9a. C is the odd one out; it has a volume of 60cm^3 . A, B and D all have a volume of 69cm^3 .

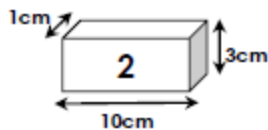
Year 6 Maths

Volume of a Cuboid

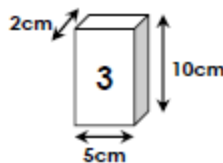
1a. Using the formula $l \times w \times h$, match the cuboids to the correct volume.



A. 30cm^3



B. 27cm^3



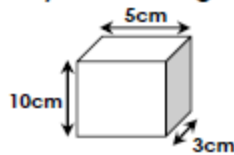
C. 100cm^3



Not to scale

VF

2a. True or false? I can find the volume of this cuboid by calculating $50\text{cm}^2 \times 5\text{cm}$.



Not to scale

VF

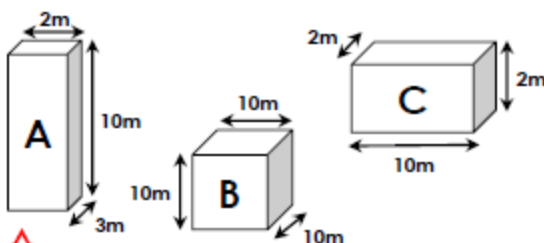
3a. Complete the table.

	l	w	h	v
Cuboid 1	3m	10m	5m	
Cube	2cm	2cm	2cm	
Cuboid 2	10cm		2cm	60cm^3



VF

4a. Order these shapes by their volume.

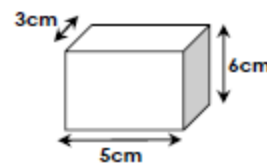


Not to scale

VF

Volume of a Cuboid

1a. Roman is calculating the volume of this cuboid. He says,



I know that $3 \times 6 = 18$, so the volume is $18 \times 5 = 90\text{cm}$.

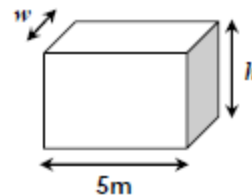
Is Roman correct? Explain why.



Not to scale

R

2a. Use the clues to find the missing dimensions of this cuboid.



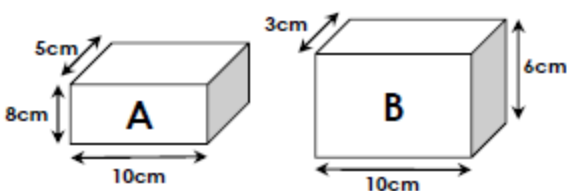
- Its volume is 30m^3 .
- The total of the length, width and height is 10m.
- The width is 1m less than the height.



Not to scale

PS

3a. Olivia is comparing two containers.



Shape B has a larger volume than shape A.

Is she correct? Explain your reasoning.



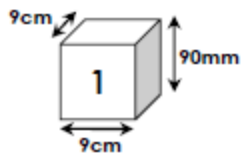
Not to scale

R

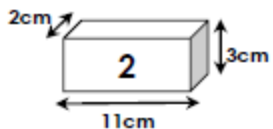
Year 6 Maths

Volume of a Cuboid

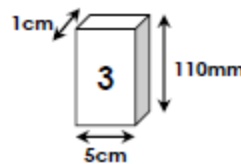
5a. Using the formula $l \times w \times h$, match the cuboids to the correct volume.



A. 55cm^3



B. 729cm^3



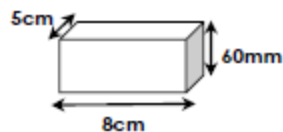
C. 66cm^3



Not to scale

VF

6a. True or false? I can find the volume of this cuboid by calculating $30\text{cm}^2 \times 8\text{cm}$.



Not to scale

VF

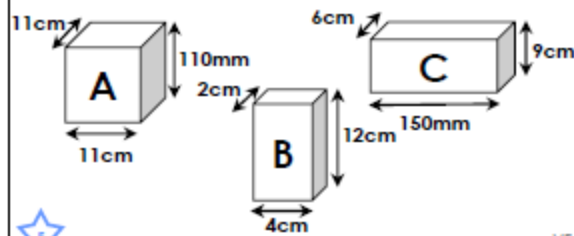
7a. Complete the table.

	l	w	h	v
Cuboid 1	4m	7m	500cm	
Cuboid 2	11cm		4cm	88cm^3
Cube		8cm		512cm^3



VF

8a. Order these shapes by their volume.

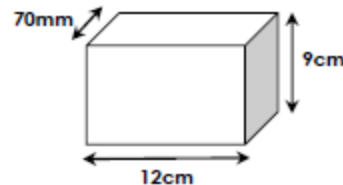


Not to scale

VF

Volume of a Cuboid

4a. Harry is calculating the volume of this cuboid. He says,



I know that $12\text{cm} \times 7\text{cm} = 84\text{cm}^2$, so the volume is $84\text{cm}^2 \times 9\text{cm} = 756\text{cm}^3$.

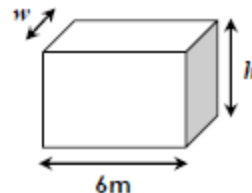
Is Harry correct? Explain why.



Not to scale

R

5a. Use the clues to find the missing dimensions of this cuboid.



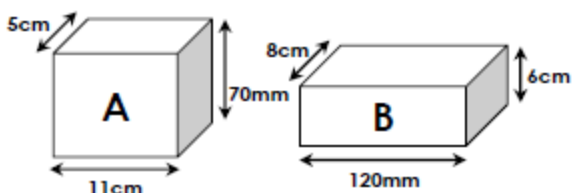
- Its volume is 720m^3 .
- The total of the length, width and height is 3,200cm.
- The width is less than the height.



Not to scale

PS

6a. Sarah is comparing two cuboids.



Shape A has a larger volume than shape B.

Is she correct? Explain your reasoning.



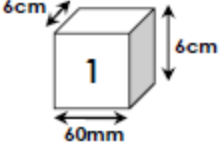
Not to scale

R

Year 6 Maths

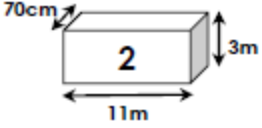
Volume of a Cuboid

9a. Match the cuboids to their correct volume.



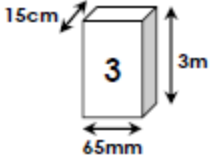
1

A.
 $29,250\text{cm}^3$



2

B. 23.1m^3



3

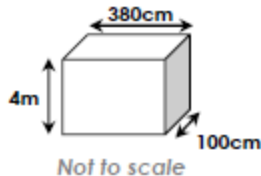
C. 216cm^3



Not to scale

VF

10a. True or false? I can find the volume of this cuboid by calculating $4\text{m}^2 \times 3.8\text{m}$.



Not to scale

VF

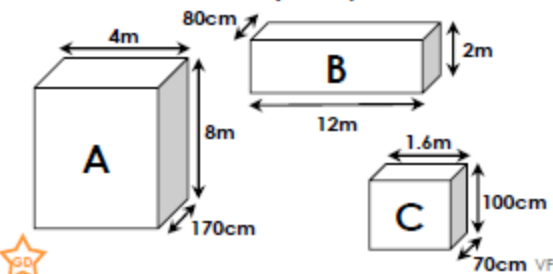
11a. Complete the table.

	l	w	h	v
Cuboid 1	1.7m	___cm	7m	9.52m^3
Cuboid 2	50mm	___cm	4.2cm	$73,500\text{mm}^3$
Cuboid 3	180cm	2.5m	11m	___ m^3



VF

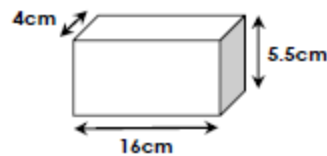
12a. Order these shapes by their volume.



VF

Volume of a Cuboid

7a. Alfie is calculating the volume of this cuboid. He says,



I know that $4\text{cm} \times 11\text{cm} = 44\text{cm}^2$, so I can find the volume using $44\text{cm}^2 \times 8\text{cm}$.

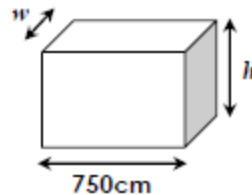
Is Alfie correct? Explain why.



Not to scale

R

8a. Use the clues to find the missing dimensions of this cuboid.



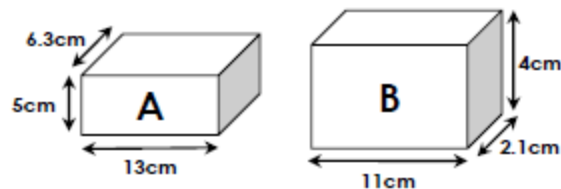
- Its volume is 300m^3 .
- The total of the length, width and height is 2,150cm.
- The width is smaller than the height.



Not to scale

PS

9a. Lily is comparing two containers.



Shape A has a larger volume than shape B.

Is she correct? Explain your reasoning.



Not to scale

R

Year 6 Maths

Answers:

Varied Fluency Volume of a Cuboid

Developing

1a. 1B, 2A, 3C

2a. False. $50\text{cm}^2 \times 3\text{cm}$ or $30\text{cm}^2 \times 5\text{cm}$

3a.

	<i>l</i>	<i>w</i>	<i>h</i>	<i>v</i>
Cuboid 1	3m	10m	5m	150m^3
Cube	2cm	2cm	2cm	8cm^3
Cuboid 2	10cm	3cm	2cm	60cm^3

4a. $C = 40\text{m}^3$, $A = 60\text{m}^3$, $B = 1,000\text{m}^3$
(or vice versa)

Expected

5a. 1B, 2C, 3A

6a. True

7a.

	<i>l</i>	<i>w</i>	<i>h</i>	<i>v</i>
Cuboid 1	4m	7m	500cm	140m^3
Cuboid 2	11cm	2cm	4cm	88cm^3
Cube	8cm	8cm	8cm	512cm^3

8a. $A = 1,331\text{cm}^3$, $C = 810\text{cm}^3$, $B = 96\text{cm}^3$
(or vice versa)

Greater Depth

9a. 1C, 2B, 3A

10a. True

11a.

	<i>l</i>	<i>w</i>	<i>h</i>	<i>v</i>
Cuboid 1	1.7m	80cm	7m	9.52m^3
Cuboid 2	50mm	3.5cm	4.2cm	$73,500\text{mm}^3$
Cuboid 3	180cm	2.5m	11m	49.5m^3

12a. $A = 54.4\text{m}^3$, $B = 19.2\text{m}^3$, $C = 1.12\text{m}^3$
(or vice versa)

Reasoning and Problem Solving Volume of a Cuboid

Developing

1a. Roman is incorrect. $3\text{cm} \times 6\text{cm} = 18\text{cm}^2$. This is then multiplied by 5cm, giving 90cm^3 .

2a. $w = 2\text{m}$, $h = 3\text{m}$

3a. Olivia is not correct because the volume of A is 400cm^3 and the volume of B is 180cm^3 . Although B looks bigger than A, the shapes are not to scale.

Expected

4a. Harry is correct. He has correctly multiplied the dimensions of the cuboid and included the correct units of measure.

5a. $w = 6\text{m}$, $h = 20\text{m}$

6a. Sarah is incorrect because the volume of A is 385cm^3 and the volume of B is 576cm^3 .

Greater Depth

7a. Alfie is correct. He has doubled one measurement to make the calculation easier, and halved the remaining measurement to account for this. The correct answer is 352cm^3 .

8a. $w = 4\text{m}$, $h = 10\text{m}$

9a. Lily is correct because the volume of A is 409.5cm^3 and the volume of B is 92.4cm^3 .

Year 6 Maths

Reasoning Questions (GDS)

1

n and p stand for two numbers.

n is a multiple of 5

p is a multiple of 6

$$\frac{n}{p} = \frac{2}{3}$$

Find numbers that n and p stand for.

Show
your
method

$n =$

$p =$

2 marks

2

Write the missing number.

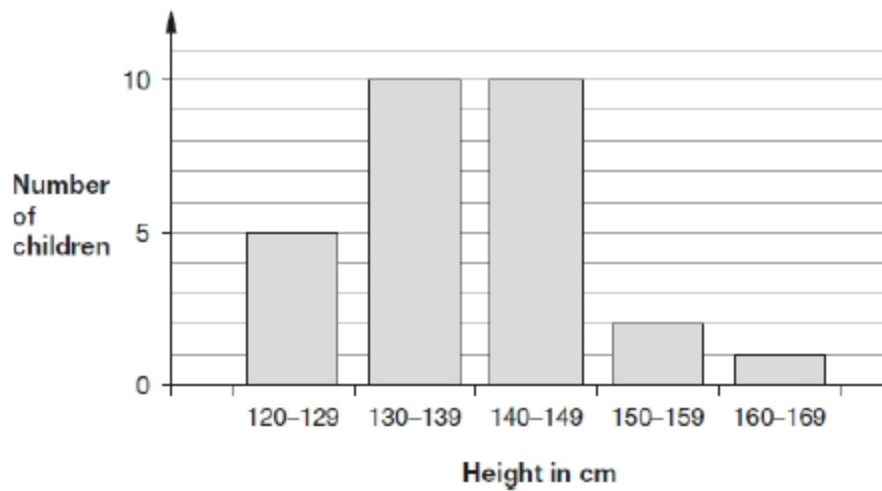
$$12.5 \div \square = 7.5 \div 1.5$$

1 mark

Year 6 Maths

3

The graph shows the heights of 28 children in Alfie's class, to the nearest centimetre.



Alfie is 153 cm tall.

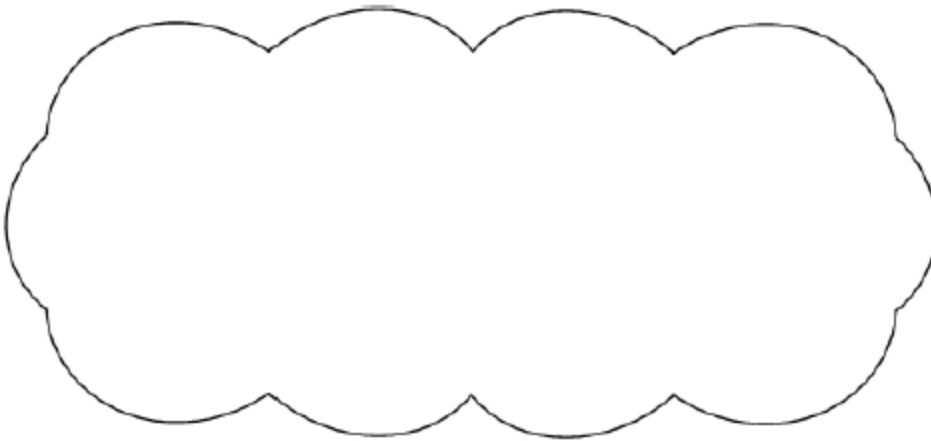
He says,

'Only one person in my class is taller than I am.'

Emma says,

'You can't tell this from the graph.'

Explain why Emma is correct.



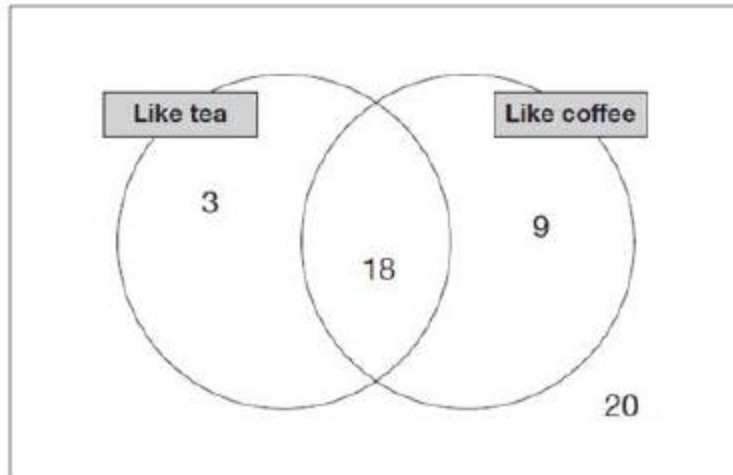
1 mark

Year 6 Maths

4

In a survey people were asked if they like tea and coffee.

The results are in this Venn diagram.



- (a) What percentage of people in the survey like both tea and coffee?

1 mark

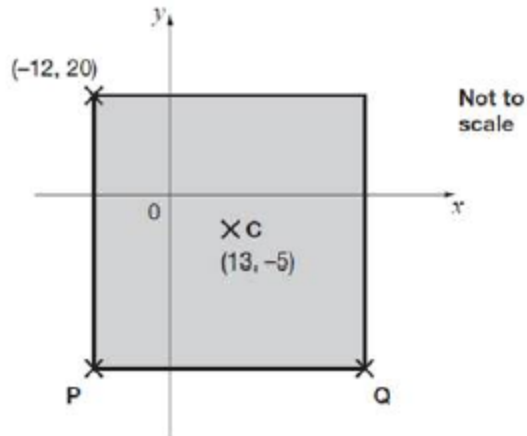
- (b) What percentage of people in the survey do not like coffee?

1 mark

Year 6 Maths

5

Here is a square on coordinate axes.



C is the centre of the square.

Find the coordinates of P and Q.

P is

1 mark

Q is

1 mark

6

Alfie did a survey to find which soup was most popular.

The choices were:

- tomato
- chicken
- mushroom



Year 6 Maths

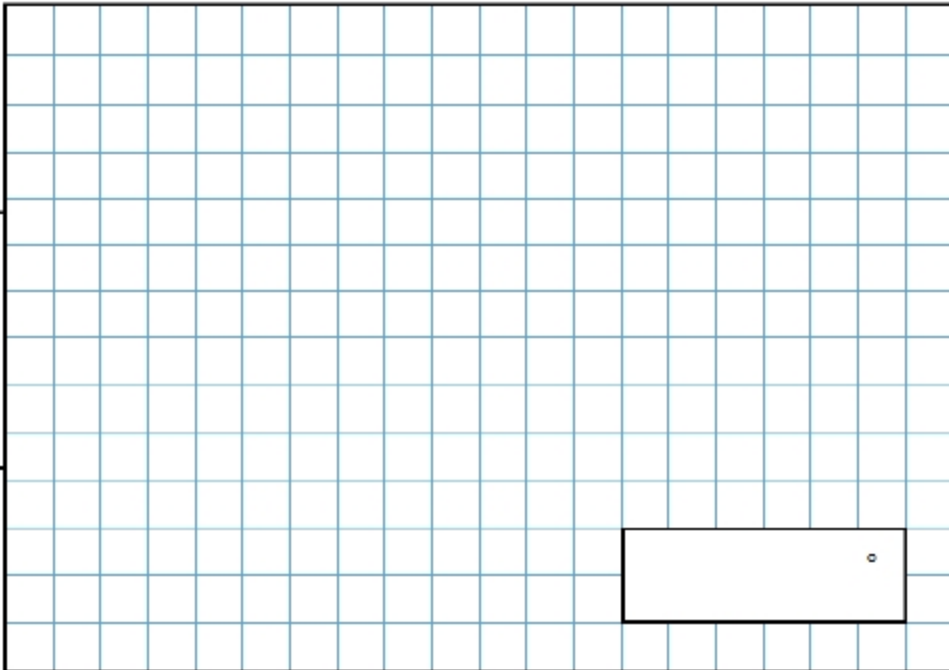
A quarter of the children chose chicken soup.

Four times as many children chose tomato soup as chose mushroom soup.

Alfie makes a pie chart to show this information.

What **angle** should he use for the children who chose tomato soup?

Show your method



3 marks

7

Three apples have a **mean** (average) mass of 100 grams.

The largest apple is removed.

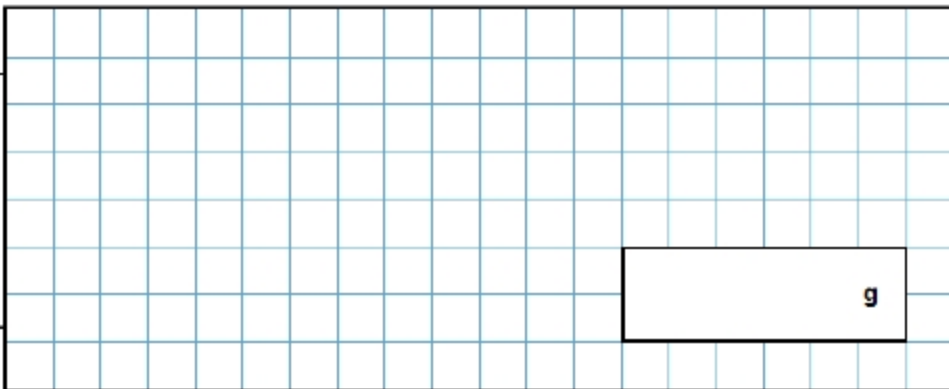
The **mean** mass of the remaining two apples is 70 grams.



Year 6 Maths

What is the mass of the largest apple?

Show your method



g

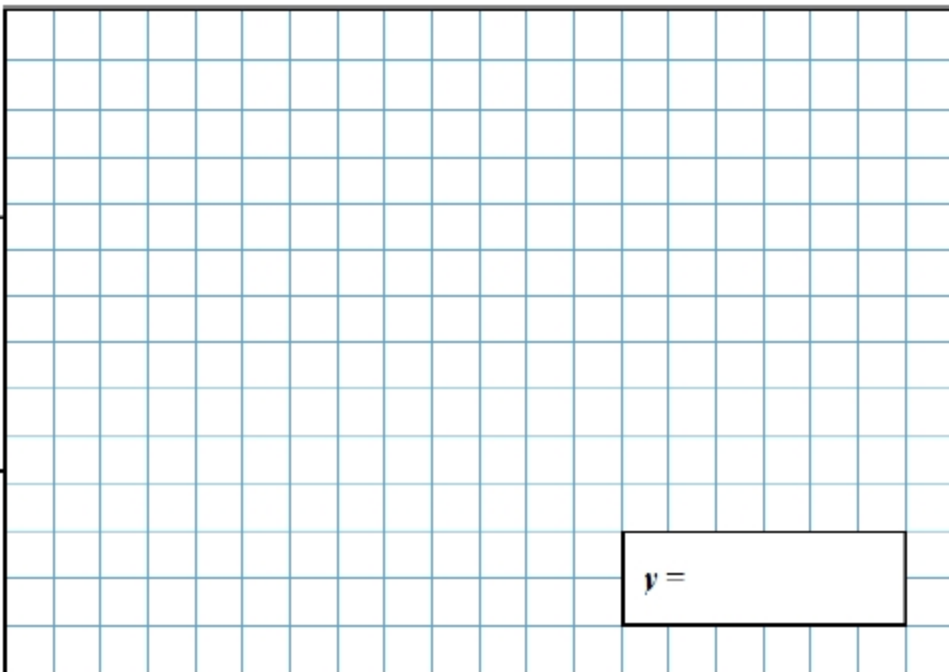
2 marks

8

Solve this equation.

$$7y + 12 = 5y + 40$$

Show your method



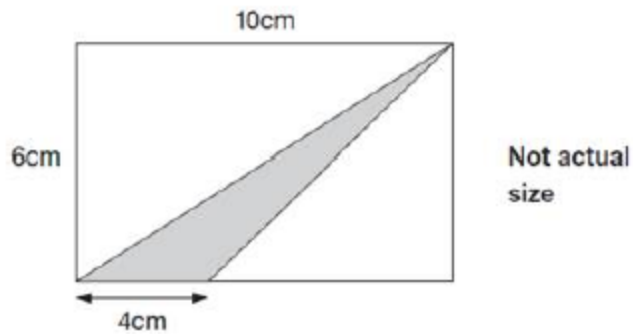
y =

2 marks

Year 6 Maths

9

The diagram shows a shaded triangle inside a rectangle.



What is the area of the shaded triangle?

Show
your
method

cm²

2 marks

Year 6 Maths

10

In a survey of children's favourite fruit juices, these were the results.

Juice	Apple	Orange	Grape	Mango
Percentage of children	25%	14%	30%	31%

- (a) 20 more children chose grape than chose apple.

How many children took part in the survey?

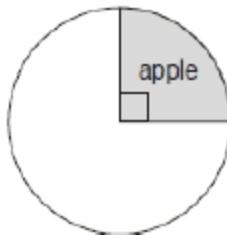
Show your method

children

2 marks

- (b) Chen makes a pie chart to show the results.

What angle should he use for the children who chose mango?



a

1 mark

Year 6 Maths

Reasoning Answers

1

Award marks as shown below for values of n and p which meet the following criteria:

	$n:p$	
	2:3	3:2
n is multiple of 5 and p is multiple of 6	2 marks [A]	1 mark [C]
n is multiple of 5 or p is multiple of 6	1 mark [B]	0 marks

The following examples are worth 2 marks:

- $n = 20$ and $p = 30$ [A]
- $n = 80$ and $p = 120$ [A]

! For 2m or 1m, accept multiple answers provided all meet the requirements for the mark(s) and are clearly distinguishable as separate answers, eg for 2 marks

- $n = 20, 40, 60$
 $p = 30, 60, 90$

or

The following examples are worth 1 mark:

- $n = 5$ and $p = 7.5$ [B]
- $n = 10$ and $p = 15$ [B]
- $n = 4$ and $p = 6$ [B]
- $n = 90$ and $p = 60$ [C]

OR

Shows or implies a method for rearranging $\frac{n}{p} = \frac{2}{3}$
which moves p from the denominator, eg:

- $3n = 2p$
- $n = \frac{2p}{3}$

Year 6 Maths

OR

Shows or implies a complete correct method, eg:

• $2 \times 5 \times 6 : 3 \times 5 \times 6$

! For 1m, condone a list of at least five additional ratios or fractions equivalent to $\frac{2}{3}$ with none incorrect

1

[2]

2

2.5

Accept equivalent fractions or decimals

[1]

3

Gives a correct explanation which demonstrates how the graph shows two children could be taller than Alfie, eg:

- One person from the class is 160-169cm. But someone as well as this person could be taller than Alfie. 2 people range from 150-159 cm, the other person could be 154, 155, etc

Minimally acceptable explanation, eg:

- *It could be 1.64, 1.56, Alfie*
- *It depends on how tall the other person in his height group is*
- *There could be someone between 150-159 cm who is taller than Alfie*

! Condone incorrect use of boundary values, eg:

- *One child is in the range 160 cm–169 cm.*
Don't know how tall the other child between 150 cm and 159 cm is

Do not accept incomplete or incorrect explanation, eg:

- *There is 1 child in the range 150 cm-159 cm taller than Alfie*
- *There could be two children taller than Alfie*

[1]

4

(a) 36

Do not accept equivalent fractions or decimals

1

(b) 46

Do not accept equivalent fractions or decimals

1

[2]

Year 6 Maths

5

- (a) P is $(-12, -30)$

! Coordinates

Accept unambiguous answers written on the diagram

1

- (b) Q is $(38, -30)$

! Answers for P and Q transposed

Award 1 mark for Q only, ie:

- P is $(38, -30)$

Q is $(-12, -30)$

! Answer for Q correctly follows through from an incorrect answer for P

Award 1m for Q for follow-through from P as

(their $x' + 50$, their y)

1

[2]

6

216

3

or

54 seen (angle for mushroom soup)

OR

Shows or implies a correct method for tomato soup with not more than one computational error, eg:

- $360 - 90 = 240$ (error)
 $240 \div 5 = 48$
 $48 \times 4 = 192$
- 0.6×360
- $25\% = \text{chicken}$
 $75\% \div 5 = 15\%$
 $15\% \text{ of } 360^\circ = 54^\circ$
 $54^\circ \times 4$

2

or

Shows the angle representing tomato soup and mushroom soup is 270

OR

60% or $\frac{3}{5}$ seen (as evidence of a correct method for tomato soup)

Year 6 Maths

OR

Shows or implies a correct method for finding the angle required to represent mushroom soup, eg:

- $360^\circ - 90^\circ = 260^\circ$ (error)
- $260^\circ \div 5 = 40^\circ$ (error)

OR

Shows or implies a correct method for tomato soup with more than one computational error, eg:

- $360^\circ - 90^\circ = 240^\circ$ (error)
- $240^\circ \times 4 \div 5 = 200^\circ$ (error)

Do not accept tomato soup is 270°

Do not accept methods involving drawings of pie charts, without any values given

Accept equivalent fractions or decimals, eg:

- $\frac{6}{10}$

- 0.6

Do not accept 60 or 60° for 60%

1

[3]

7

160

! Measures
See guidance

2

or

Shows or implies a complete correct method, eg:

- $3 \times 100 = 300$
- $2 \times 70 = 140$
- $300 - 140$

1

[2]

8

14

! Algebra
See guidance

2

Year 6 Maths

or

Shows or implies a correct first step of algebraic manipulation that either reduces the number of terms or collects variables on one side of the equation and numbers on the other, eg:

- $2y + 12 = 40$
- $7y = 5y + 28$
- $7y - 5y = 40 - 12$
- $2y = 28$
- $28 \div 2$

! Condone correct embedded solutions

Award 1 mark, for a response which shows 14 as the embedded solution to their working, eg:

- $7y + 12 = 5y + 40$
 $(7 \times 14) + 12 = (5 \times 14) + 40$
 $110 = 110$

1

[2]

9

12

2

or

Shows or implies a complete correct method, eg:

- $4 \times 6 \div 2 = 13$ (error)
- $60 - (10 \times 6 \div 2) - (6 \times 6 \div 2)$
- $60 - 48$

1

[2]

10

(a) 400

2

or

Shows or implies a complete correct method, eg:

- $30\% - 25\% = 5\%$
 $5\% = 20$
 $100\% = 20 \times 20$

1

(b) 111.6 or 112

Do not accept 111

1

[3]