

NumberSense Assessment Portfolio – Grade 6

Part A Contents

	Page
Term 1 Assignment.....	1
Term 1 Class test.....	4
Term 2 Class test.....	10
Term 2 Mid-year exam.....	15
Term 1 Assignment Marking tool.....	23
Term 1 Class test Marking tool.....	26
Term 2 Class test Marking tool.....	31
Term 2 Mid-year exam Marking tool.....	38



Name: _____

Class: _____

- You should complete this assignment in class and work alone.
- Complete all answers on this question paper.
- You may use your NumberSense Workbook or any other Mathematics notes to help you, but you should not use a calculator.
- You should complete this assignment in no more than 40 minutes.
- This assignment is for 25 marks.

1. A box of Smarties has 30 Smarties in it.

a. How many Smarties in $\frac{1}{5}$ of a box? _____ Smarties (1)

b. How many Smarties in $\frac{1}{2}$ of a box? _____ Smarties (1)

c. How many Smarties in $\frac{1}{5} + \frac{1}{2}$ of a box? _____ Smarties

Write your answer as a fraction of the whole box of Smarties.

_____ (2)

d. Use the box of Smarties to help you write the following as single fractions. Show your thinking.

• $\frac{1}{2} + \frac{1}{3}$

• $\frac{1}{3} + \frac{2}{5}$

• $\frac{2}{3} + \frac{7}{10}$

(6)

- (3)

4. Determine the value of A and B in the tables. Show your thinking.

a.

Input	2	3	4	6
Output	1	4	A	13

A = _____ (2)

b.

Input	2	3	4	6
Output	3	5	B	17

B = _____ (2)

5. In a sequence of numbers, 1 is repeated once, 2 twice, 3 three times. Later 10 is repeated ten times, 11 eleven times and so on.

The sequence starts: 1; 2; 2; 3; 3; 3; 4; 4; 4; 4; 5; 5; 5; 5; 5; 6; 6; ...

Determine the 50th number in the sequence. Show your thinking.

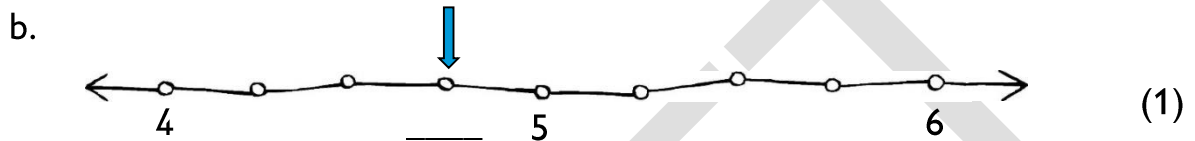
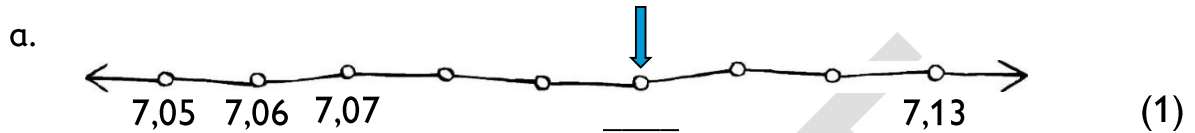
(2)

Name: _____

Class: _____

- Complete all answers on this question paper.
- Calculators may not be used.

1. Determine the values indicated by the arrows.



2. a. Write 0,19 as an equivalent common fraction. _____ (1)

b. Write $\frac{7}{20}$ as an equivalent decimal fraction. _____ (1)

3. Which numbers are prime numbers? Select all that apply.

☐ 18 ☒ 19 ☐ 21 ☒ 23 ☐ 27 (1)

4. Complete. Fill in the answer only.

a. $576 + 382 =$ _____ (1)

b. $1,5 + 3,7 + 10,3 =$ _____ (1)

c. $\frac{2}{9} + \frac{5}{9} =$ _____ (1)

d. $12 -$ _____ $= 11,99$ (1)

e. $10 \times 0,056 =$ _____ (1)

f. $\frac{1}{12}$ of 84 = _____ (1)

g. Half of 84 750 = _____ (1)

5. Calculate $\frac{9}{16} + \frac{3}{4}$. Show your thinking.

(2)

6. Lara mixes 50 ml of blue paint with 400 ml yellow paint to make green paint.

a. Write down the ratio of blue paint to yellow paint in its simplest form. _____ (1)

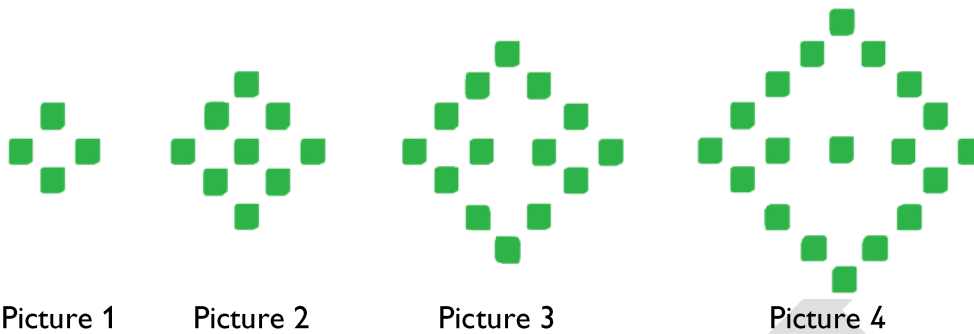
- b. Lara needs to make more of the same colour green. She uses 25 ml of blue paint. How much yellow paint should she use?

_____ ml (1)

7. A reservoir is $\frac{1}{4}$ full. If 135 l of water is added, the reservoir is $\frac{7}{8}$ full. What is the capacity of the reservoir when full? Show your thinking.

_____ l (3)

8. Nomsa draws pictures with dots like this and completes a table to calculate the number of dots in pictures 1 to 5.



Picture 1

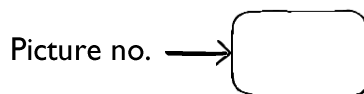
Picture 2

Picture 3

Picture 4


Picture number	1	2	3	4	5	6
Number of dots	4	9	14	19	24	29

- a. Complete the flow diagram to show how you can calculate the number of dots if you know the picture number.



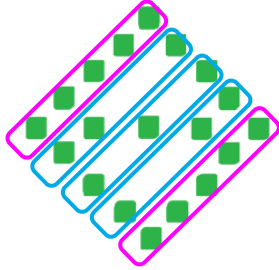


(2)

- b. Zoliswa looked for patterns in the picture.



I see two ends and groups of 3 dots inbetween.

Picture 2
Picture 3
Picture 4

Complete.

Picture 1: $2 \times 2 + 0 \times 3 = 4$

Picture 2: $2 \times 3 + 1 \times 3 = 9$

Picture 3: $2 \times 4 + 2 \times 3 = 14$

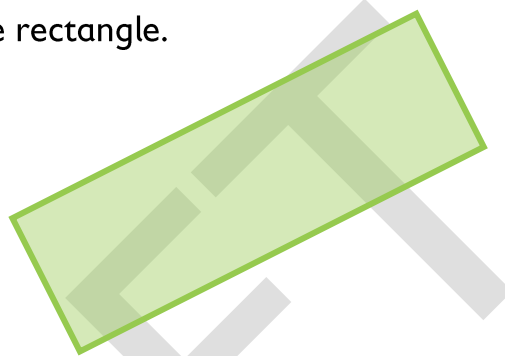
Picture 4: $2 \times \underline{\quad\quad} + \underline{\quad\quad} \times 3 = 19$

(1)

- c. Use Zoliswa's method to determine the number of dots in picture 40. Be sure to show your thinking.

_____ dots (2)

9. Draw all lines of symmetry on the rectangle.



(1)

10. For each statement, select whether the statement is true or false. If it is false, write the correct statement alongside.

- a. The diagonals of rectangles are equal.

☐ True ☐ False

Correction (if required):

(1)

- b. The diagonals of a rectangle meet at right angles.

☐ True ☐ False

Correction (if required):

(1)

11. A rectangular kitchen table is three times as long as it is wide. If it were 3 m shorter and 3 m wider, it would be a square. How long is the table? Show your thinking.

_____ m (2)

12. Yusuf takes a bus from Gqeberha to East London. The bus leaves Gqeberha at 06:55 and arrives at East London at 11:25. How long is the bus ride?

_____ (1)

13. Singapore is 8 hours ahead of the UTC zone.

South Africa is 2 hours ahead of the UTC zone.

If it is 15:30 in South Africa, what is the time in Singapore? Show your thinking.

_____ (2)

14. A magic substance is placed in a container, where it doubles in quantity every minute. If the container is full after one hour, after how many minutes was it half-full?

_____ minutes (1)

15. Three consecutive numbers, e.g. 15, 16 and 17, multiplied together give 504. What is the sum of the three numbers? Show your thinking.

_____ (2)

DRAFT

Name: _____

Class: _____

- Complete all answers on this question paper.
- Calculators may not be used.

1. a. Write 0,03 as an equivalent common fraction. _____ (1)

b. Write $\frac{7}{20}$ as an equivalent percentage. _____ (1)

2. Which number is bigger? Select the correct one and explain your thinking.

a. ☐ $\frac{3}{5}$ or ☐ $\frac{3}{7}$ because: _____ (2)

b. ☐ $\frac{7}{10}$ or ☐ $\frac{3}{4}$ because: _____ (2)

3. Complete. *Fill in the answer only.*

a. $15,37 = 15 + \underline{\hspace{2cm}} + 0,07$ (1)

b. $R24,95 + R7,95 = R\underline{\hspace{2cm}}$ (1)

c. $R20 - R16,40 = R\underline{\hspace{2cm}}$ (1)

d. $57,2 - 12,8 = \underline{\hspace{2cm}}$ (1)

e. $5 - \frac{2}{7} = \underline{\hspace{2cm}}$ (1)

f. $\frac{7}{10} - \frac{1}{2} = \underline{\hspace{2cm}}$ (1)

g. $0,7 \times 5 = \underline{\hspace{2cm}}$ (1)

h. $\frac{4}{5}$ of 60 = $\underline{\hspace{2cm}}$ (1)

i. $\frac{1}{5}$ of $\frac{1}{2} =$ _____ (1)

j. $5 + 4 \times 12 =$ _____ (1)

4. Calculate. *Show your thinking.*

a. $184 + 68 + 403$

(2)

b. $4\frac{2}{3} + 1\frac{4}{9}$

(2)

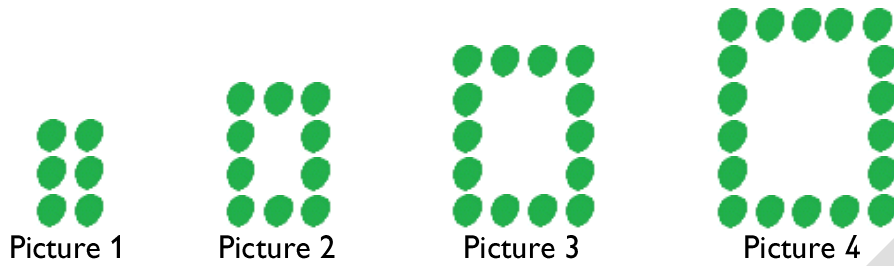
5. Katie spends half of her pocket money on mobile data, she uses one eighth to buy sweets and saves one eighth. She has R15 left. How much pocket money did she have? Show your thinking.

R_____ (2)

6. Mandla eats twice as many sweets as Jason in half the time. Jason eats 12 sweets in 10 minutes. How many sweets does Mandla eat in the same time? Show your thinking.

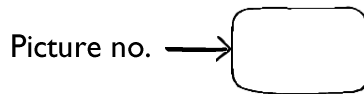
_____ sweets (2)

7. Nomsa draws pictures with dots like this and completes a table to calculate the number of dots in pictures 1 to 6.



Picture number	1	2	3	4	5	6
Number of dots	6	10	14	18	22	26

- a. How many dots will there be in picture 7? _____ dots (1)
- b. Complete the flow diagram to show how you can calculate the number of dots if you know the picture number.



(2)

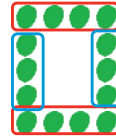
- c. Zoliswa looked for patterns in the picture.



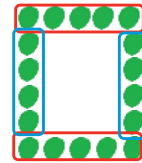
I see a top and bottom row and two sides.



Picture 2



Picture 3



Picture 4

$$P2: 2 \times 3 + 2 \times 2$$

$$P3: 2 \times 4 + 2 \times 3$$

$$P4: 2 \times 5 + 2 \times 4 \text{ etc.}$$

Use Zoliswa's method to determine the number of dots in picture 100. Be sure to show your thinking.

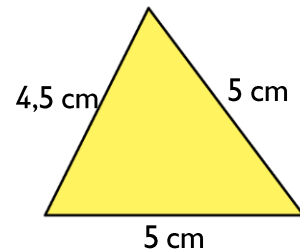
_____ dots (2)

- d. Determine which picture in Nomsa's patterns would use exactly 58 dots show your thinking.

Picture _____ (2)

8. a. Calculate the perimeter of the triangle.
Show your thinking.

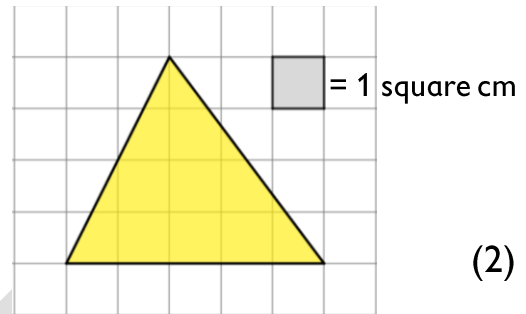
_____ cm



(2)

- b. Calculate the area of the triangle.
Show your thinking.

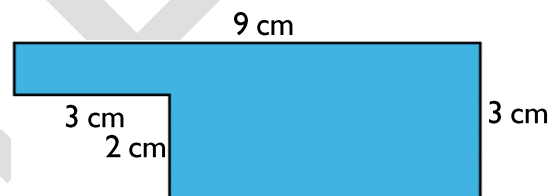
_____ square cm



(2)

9. a. Calculate the area of the shape (not drawn to scale).
Show your thinking.

_____ cm²

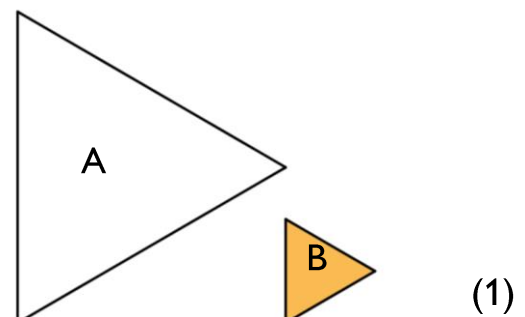


(2)

- b. Calculate the perimeter of the shape. Show your thinking.

_____ cm (2)

10. A side of the equilateral triangle A is three times the length of a side of equilateral triangle B. How many triangles B will fit into triangle A?



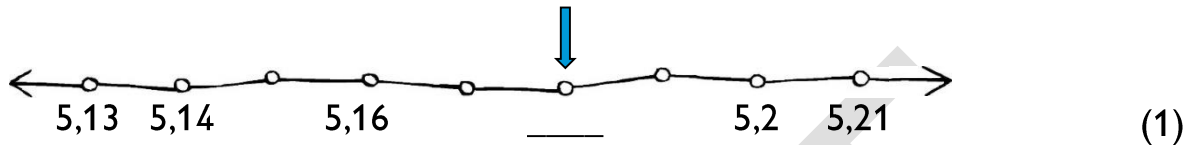
(1)

Name: _____

Class: _____

- Complete all answers on this question paper.
- Calculators may not be used.

1. Determine the value indicated by the arrow.



2. a. Write 0,25 as an equivalent common fraction. _____ (1)

b. Write $\frac{42}{100}$ as an equivalent decimal fraction. _____ (1)

c. Write $\frac{8}{25}$ as an equivalent percentage. _____% (1)

3. Which number is bigger? Select the correct one and explain your thinking.

a. ☐ $\frac{5}{8}$ or ☒ $\frac{5}{12}$ because: _____ (2)

b. ☐ $\frac{4}{25}$ or ☒ $\frac{3}{20}$ because: _____ (2)

4. Complete. *Fill in the answer only.*

a. $364 + 255 =$ _____ (1)

b. $R21,90 + R15,90 = R$ _____ (1)

c. $1\frac{2}{5} + \frac{3}{5} =$ _____ (1)

d. $\frac{9}{16} - \frac{3}{8} =$ _____ (1)

e. $40 \times 1,2 =$ _____ (1)

f. $\frac{3}{4}$ of 240 = _____ (1)

g. Half of 100 824 = _____ (1)

h. $36 - 21 \div 3 =$ _____ (1)

5. Calculate $5\frac{1}{2} - 2\frac{5}{8}$. Show your thinking.

(2)

6. Themba makes toy bicycles using $1\frac{2}{3}$ metre of wire. If he has 15 metres of wire, how many toy bicycles can he make? Show your thinking.

_____ bicycles (2)

7. Which one of these is NOT true? Select one.

☐ $(1 + 1) \div (1 + 1) = 1$

☐ $2 \div 2 + 2 \div 2 = 2$

☐ $3 \times 3 - 3 + 3 = 3$

☐ $(4 - 4) \times 4 + 4 = 4$

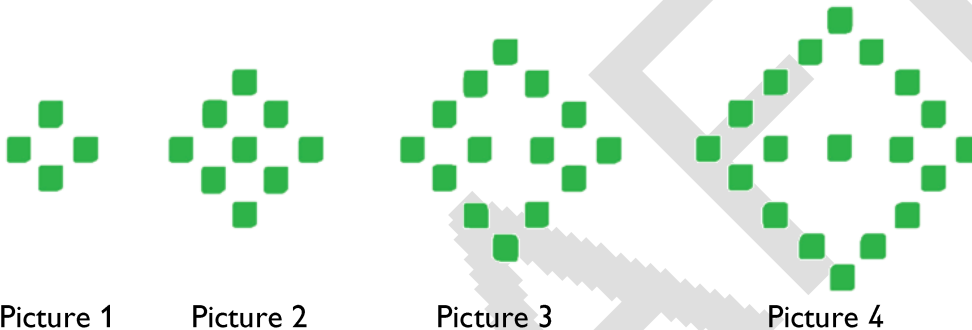
☐ $5 + 5 \times (5 - 5) = 5$

(1)

8. Zoliswa opens a book and multiplies the two page numbers. She calculates 1 332. What is the page number of the page on the left? Show your thinking.

Page _____ (3)

9. Nomsa draws pictures with dots like this and completes a table to calculate the number of dots in pictures 1 to 5.



Picture number	1	2	3	4	5	6
Number of dots	4	9	14	19	24	29

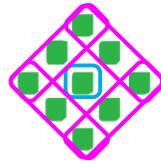
- a. Determine the number of dots in picture 8.

_____ dots (1)

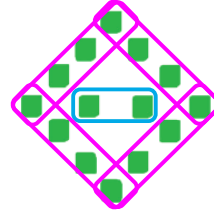
- b. Abdul looked for patterns in the picture.



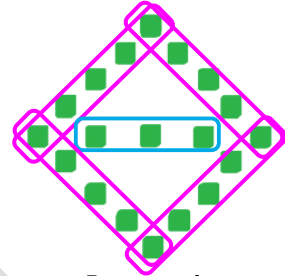
I see four sides of a diamond and a diagonal row of dots in the middle.



Picture 2



Picture 3



Picture 4

Complete.

Picture 1: $4 \times 2 - 4 + 0 = 4$

Picture 2: $4 \times 3 - 4 + 1 = 9$

Picture 3: $4 \times 4 - 4 + 2 = 14$

Picture 4: $4 \times \underline{\hspace{2cm}} - 4 + \underline{\hspace{2cm}} = 19$ (1)

- c. Use Abdul's method to determine the number of dots in picture 50. Be sure to show your thinking.

 dots (2)

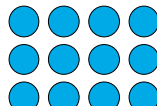
10. Fundi draws pictures with dots like this. The first four pictures make a pattern.



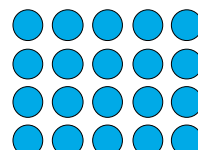
Picture 1



Picture 2



Picture 3



Picture 4

How many dots will there be in picture 50? Show your thinking.

 dots (2)

11. Sally used her GeoGenius Construction kit pieces to make this polyhedron.



- a. What is the name of the polyhedron? Select all the correct options.

- | | | |
|--|--|-----|
| <input type="checkbox"/> Pentagon | <input type="checkbox"/> Pentagonal-based pyramid | |
| <input type="checkbox"/> Pentagonal -based prism | <input type="checkbox"/> Pentagonal -based antiprism | |
| <input type="checkbox"/> Pentahedron | <input type="checkbox"/> Hexahedron | (2) |

- b. How many vertices does this polyhedron have?

_____ vertices (1)

12. For each statement, select whether the statement is true or false. If it is false, write the correct statement alongside.

- a. The diagonals of a parallelogram are equal.

- ☐ True ☐ False

Correction (if required):

(1)

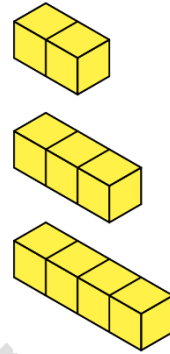
- b. The diagonals of a square meet at right angles.

- ☐ True ☐ False

Correction (if required):

(1)

13. If we place cubes side by side in a row on a table, only some of the faces are visible. For example, with 2 cubes in a row 8 faces are visible; with 3 cubes in a row 11 faces are visible with 4 cubes in a row 14 faces are visible etc. If 50 faces are visible, how many cubes are there in the row? Show your thinking.



_____ cubes (2)

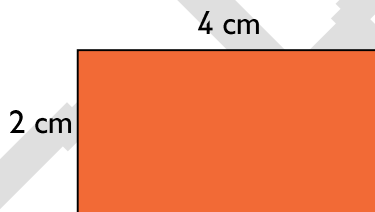
14. Los Angeles is 8 hours behind of the UTC zone.

South Africa is 2 hours ahead of the UTC zone.

If it is 17:45 in South Africa, what is the time in Los Angeles? Show your thinking.

_____ (2)

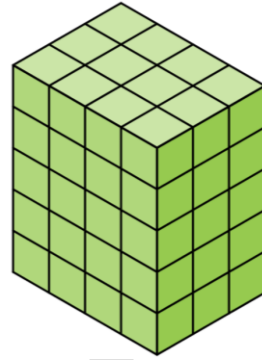
15. Calculate the perimeter and area of the rectangle.



Perimeter = _____ cm

Area = _____ cm² (2)

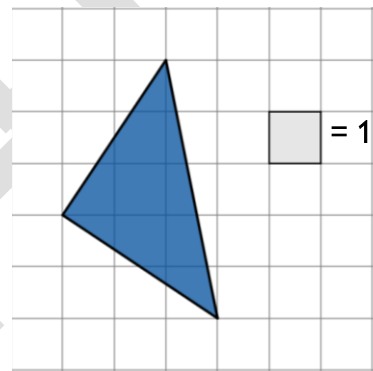
16. The rectangular prism is made up of 1 cm by 1 cm by 1 cm cubes. It has dimensions 4 cm by 3 cm by 5 cm.



- a. Calculate the volume of the prism. _____ cm^3 (1)
- b. Determine the surface area of the prism. Show your thinking.

_____ cm^2 (2)

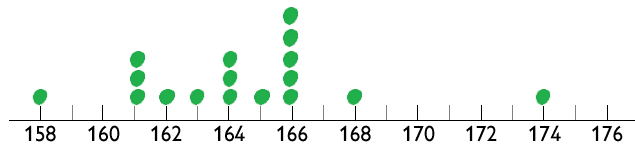
17. Determine the area of the triangle.
Show your thinking.



_____ square units

(2)

18. Jason recorded the height of the players in the school rugby team in centimetres on a dot plot.



- Determine the modal height of the players. _____ cm (1)
- Determine the median height of the players. _____ cm (1)
- The player who is 158 cm tall leaves Jason's school. A new player is selected for the team who is 172 cm tall.
 - Will this change the mode? If so, what is the new mode?
_____ cm
 - Will this change the median? If so, what is the new median?
_____ cm (2)

To prepare for this assessment, learners should have completed NumberSense Workbook 21, pages 1 – 38.

Memo:

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.a.	6	1 mrk: correct	NOR	21.1;	K	(1)
1.b.	15	1 mrk: correct	NOR	21.19; 21.25	K	(1)
1.c.	21 $\frac{21}{30}$ or $\frac{7}{10}$	1 mrk: 21 correct 1 mrk: fraction correct	NOR	21.19	K	(2)
1.d.	<ul style="list-style-type: none"> $\frac{1}{2} + \frac{1}{3} = 15 \text{ Smarties} + 10 \text{ Smarties}$ $= 25 \text{ Smarties}$ $= \frac{25}{30}$ or $\frac{5}{6}$ $\frac{1}{3} + \frac{2}{5} = 10 \text{ Smarties} + 12 \text{ Smarties}$ $= 22 \text{ Smarties}$ $= \frac{22}{30}$ or $\frac{11}{15}$ $\frac{2}{3} + \frac{7}{10} = 20 \text{ Smarties} + 21 \text{ Smarties}$ $= 41 \text{ Smarties}$ $= \frac{41}{30}$ or $1\frac{11}{30}$ 	1 mrk: EACH correct 1 mrk: EACH valid thinking	NOR	21.19	A	(6)
2.a.	2: 5	1 mrk: correct	NOR	21.23	K	(1)
2.b.	$\frac{5}{7}$	1 mrk: correct	NOR	21.23	A	(1)
2.c.	10	1 mrk: correct	NOR	21.23	A	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
2.d.	14	1 mrk: correct	NOR	21.23	A	(1)
2.e.	40 and 100 <i>Possible thinking:</i> <ul style="list-style-type: none"> Mr Daniels hands out 7 biscuits at a time. For 140 biscuits he will hand this out 20 times. $2 \times 20 = 40$ and $5 \times 20 = 100$ 	1 mrk: correct 1 mrk: valid thinking	NOR	21.23		(2)
3.	72600 <i>Possible thinking:</i> <ul style="list-style-type: none"> $726 \times 32 + 726 \times 68 = 726 \times (32 + 68)$ $= 726 \times 100$ $= 72600$ $726 \times 32 = 726 \times 30 + 726 \times 2$ $= 21780 + 1452$ $= 23232$ And $726 \times 68 = 726 \times 60 + 726 \times 8$ $= 43560 + 5808$ $= 49368$ $23232 + 49368 = 72600$	1 mrk: correct 1 mrk: valid thinking 1 mrk: using efficient thinking (first method) <i>Note that while the second method given is correct, it is long and cumbersome and errors are easily made.</i>	NOR	21.3	R	(3)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
4.a.	<p>7</p> <p><i>Possible thinking:</i></p> <ul style="list-style-type: none"> When input increases by 1, output increases by 3 and when input increases by 3, output increases by 3×3. So, input is multiplied by 3 and then 5 is subtracted to get output. $4 \times 3 - 5 = 7$ input $\rightarrow \times 3 \rightarrow -5 \rightarrow$ output and $4 \times 3 \rightarrow 12 - 5 \rightarrow 7$ 	<p>1 mrk: correct</p> <p>1 mrk: valid thinking</p>	PFA	21.22	A	(2)
4.b.	<p>8</p> <p><i>Possible thinking:</i></p> <ul style="list-style-type: none"> There is not a constant difference in the output, i.e. at first an increase of 1 in input results in an increase of 2, but then an increase of 3 in input results in increase of 12 in output (not 2×3). Guess adding consecutive numbers and check: $3 + 2 \rightarrow 5 + 3 \rightarrow 8 + 4 \rightarrow 12 + 5 \rightarrow 17$ 	<p>1 mrk: correct</p> <p>1 mrk: valid thinking</p>	PFA		R	(2)
5.	<p>10</p> <p><i>Possible thinking:</i></p> <ul style="list-style-type: none"> Count the terms. $1 + 2 \rightarrow 3 + 3 \rightarrow 6 + 4 \rightarrow 10 + 5 \rightarrow 15 + 6 \rightarrow 21 + 7 \rightarrow 28 + 8 \rightarrow 36 + 9 \rightarrow 45 + 10 \rightarrow 55$. So the 50th term will be one of the 10s 	<p>1 mrk: correct</p> <p>1 mrk: valid thinking</p>	PFA		R	(2)

To prepare for this assessment, learners should revise from NumberSense Workbook 21, pages 1 – 30; pages 39– 46 (Space & Shape) and pages 47 – 51 (Time).

Assessment framework:

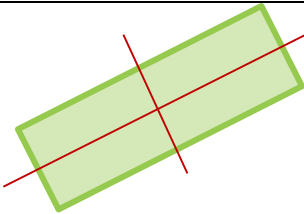
		Cognitive domain						
		Knowing (K)		Applying (A)		Reasoning (R)		TOTAL
Content area	Number, operations and relationships (NOR)	1a(1), 2a(1), 3(1), 4a(1), 4c(1), 4d(1), 4f(1), 4g(1)	8	1b(1), 2b(1), 4b(1), 4e(1), 5(2), 6(2)	8	7(3), 15(2)	5	21
	Patterns, functions & algebra (PFA)	8a(2)	2	8b(1), 8c(2)	3			5
	Space & shape (SS)	9(1)	1	10(2)	2	11(2)	2	5
	Measurement (M)	12(1)	1	13(2)	2	14(1)	1	4
	Data handling (DH)							
	TOTAL	12		15		8		35

Memo:

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.a.	7,1 or 7,10	1 mrk: correct	NOR	21.12	K	(1)
1.b.	$4\frac{3}{4}$ or 4,75	1 mrk: correct	NOR	21.12	A	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
2.a.	$\frac{19}{100}$	1 mrk: all correct	NOR	21.12	K	(1)
2.b.	0,35	1 mrk: correct	NOR	21.12	A	(1)
3.	19 and 23	1 mrk: correct and no extra	NOR	21.4	K	(1)
4.a.	958	1 mrk: correct	NOR	21.2; 21.8; 21.17	K	(1)
4.b.	15,5	1 mrk: correct	NOR	21.5; 21.17	A	(1)
4.c.	$\frac{7}{9}$	1 mrk: correct	NOR	21.26	K	(1)
4.d.	0,01	1 mrk: correct	NOR	21.12	K	(1)
4.e.	0,56	1 mrk: correct	NOR	21.18	A	(1)
4.f.	7	1 mrk: correct	NOR	21.1; 21.19; 21.25	K	(1)
4.g.	42375	1 mrk: correct	NOR	21.25; 21.27	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
5.	$\frac{21}{16}$ or $1\frac{5}{16}$ <i>Possible thinking:</i> <ul style="list-style-type: none"> $\frac{3}{4} = \frac{12}{16}$; $\frac{9}{16} + \frac{12}{16} = \frac{16}{16} + \frac{5}{16} = 1\frac{5}{16}$ $\frac{9}{16} + \frac{3}{4} = \frac{9}{16} + \frac{12}{16} = \frac{21}{16}$ 	1 mrk: correct 1 mrk: valid thinking	NOR	21.26	A	(2)
6.a.	1:8	1 mrk: correct	NOR	21.23	A	(1)
6.b.	200	1 mrk: correct	NOR	21.23	A	(1)
7.	216 <i>Possible thinking:</i> <ul style="list-style-type: none"> $\frac{7}{8} - \frac{2}{8} = \frac{5}{8}$ water added, so $\frac{5}{8} = 135l$, then $\frac{1}{5} = 135 \div 5 = 27l$ and full $= \frac{8}{8} = 27 \times 8 = 216l$ 	1 mrk: calculating $\frac{5}{8}$ 1 mrk: dividing 135 by 5 1 mrk: multiplying result by 8	NOR	21.26	R	(3)
8.a.	<i>Picture no. $\rightarrow \times 5 \rightarrow - 1 \rightarrow$ no. of dots</i>	1 mrk: $\times 5$ 1 mrk: $- 1$	PFA	21.22	K	(2)
8.b	$2 \times 5 + 3 \times 3 = 19$	1 mrk: 5 and 3 correct	PFA	21.6	A	(1)
8.c.	$2 \times 41 + 39 \times 3 = 84 + 120 + 18$ $= 199$	1 mrk: Showing "Zoliswa's" method 1 mrk: correct substitution of 41 and 39	PFA	21.7	A	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
9.		1 mrk: correct	SS	21.39	K	(1)
10.a.	True	1 mrk: correct	SS	21.39; 21.46	A	(1)
10.b.	False The diagonals of a square meet at right angles OR The diagonals of a rectangle bisect each other	1 mrk: correct <i>Note that this mark should only be awarded with a correction.</i>	SS	21.39; 21.41; 21.42; 21.46	A	(1)
11.	9 <i>Possible thinking:</i> <ul style="list-style-type: none"> $3 \times \text{the width} - 3m = \text{the width} + 3m$, so double the width = $6m$ and the width = $3m$. Since the table is 3 times longer $3 \times 3m = 9m$ 	1 mrk: correct 1 mrk: valid thinking	SS		R	(2)
12.	$4\frac{1}{2}$ hours or 4,5 hours or 4 hours and 30 minutes	1 mrk: correct	M	21.47; 21.48	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
13.	21:30 <i>Possible thinking:</i> <ul style="list-style-type: none"> • $8 - 2 = 6$ hours ahead. $15:30 + 6\text{hrs} = 21:30$ • $15:30 - 2\text{hrs} = 13:30$ at UTC and $13:30 + 8 = 21:30$ in Singapore 	1 mrk: correct 1 mrk: valid thinking	M	21:50; 21:51	A	(2)
14.	59 minutes	1 mrk: correct	M	21:48	R	(1)
15.	24 <i>Possible thinking (Guess and check):</i> <ul style="list-style-type: none"> • Since $10 \times 10 \times 10 = 1000$, start with half of 10: $5 \times 6 \times 7 = 5 \times 42 = 210$ (too low) $6 \times 7 \times 8 = 42 \times 8 = 336$ (still too low) $7 \times 8 \times 9 = 8 \times 63 = 504$ and $7 + 8 + 9 = 24$ 	1 mrk: correct 1 mrk: valid thinking	NOR		R	(2)

To prepare for this assessment, learners should revise from NumberSense Workbook 21, pages 31 – 38; Workbook 22 pages 1– 30 and 49-60 (Length & Area).

Assessment framework:		Cognitive domain						
		Knowing (K)		Applying (A)		Reasoning (R)		TOTAL
Content area	Number, operations and relationships (NOR)	1a(1); 2a(2); 3a(1); 3b(1); 3c(1), 3e(1), 3h(1), 4a(2)	10	1b(1); 2b(2); 3d(1), 3f(1), 3g(1), 3i(1), 3j(1), 4b(2)	10	5(2), 6(2)	4	24
	Patterns, functions & algebra (PFA)	7a(1), 7b(2)	3	7c(2)	2	7d(2)	2	7
	Space & shape (SS)							
	Measurement (M)	8a(2)	2	8b(2), 9(4)	6	10(1)	1	9
	Data handling (DH)							
	TOTAL	15		18		7		40

Memo:

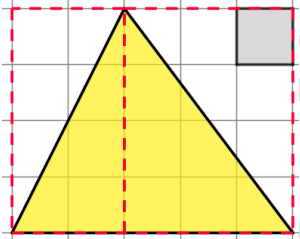
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.a.	$\frac{3}{100}$	1 mrk: correct	NOR	22.11	K	(1)
1.b.	35%	1 mrk: correct	NOR	22.4; 22.11	A	(1)

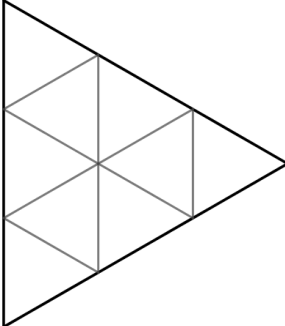
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
2.a.	$\frac{3}{5}$ <i>Possible explanation:</i> <ul style="list-style-type: none"> Because the number of pieces is the same, but the more pieces something is cut up into, the smaller each piece will be. Could draw a number line with fifths and sevenths accurately marked. Could draw 2 “wholes” of the same size, accurately cut into fifths and sevenths and shade the correct pieces. $\frac{3}{5} = \frac{21}{35}$ and $\frac{3}{7} = \frac{15}{35}$. $21 > 15$ 	1 mrk: correct 1 mrk: valid explanation <i>The last example, although correct, shows little understanding and could suggest that learners are simply memorising procedures without thinking.</i>	NOR	22.11	K	(2)
2.b.	$\frac{3}{4}$ <i>Possible explanation:</i> <ul style="list-style-type: none"> $\frac{7}{10} = 70\%$ and $\frac{3}{4} = 75\%$. $70\% < 75\%$ $\frac{7}{10} = \frac{28}{40}$ and $\frac{3}{4} = \frac{30}{40}$. $\frac{28}{40} < \frac{30}{40}$ 	1 mrk: correct 1 mrk: valid explanation	NOR	22.12	A	(2)
3.a.	0,3	1 mrk: correct	NOR		K	(1)
3.b.	32,90	1 mrk: correct	NOR	22.2	K	(1)
3.c.	3,60	1 mrk: correct	NOR	22.5	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
3.d.	44,4	1 mrk: correct	NOR	22.8; 22.10; 22.13	A	(1)
3.e.	$4\frac{5}{7}$	1 mrk: correct	NOR	22.14	K	(1)
3.f.	$\frac{2}{10}$ or $\frac{1}{5}$	1 mrk: correct	NOR	22.30	A	(1)
3.g.	3,5	1 mrk: correct	NOR	22.1	A	(1)
3.h.	48	1 mrk: correct	NOR	22.14	K	(1)
3.i.	$\frac{1}{10}$	1 mrk: correct	NOR	21.36; 22.19	A	(1)
3.j.	53	1 mrk: correct	NOR	22.7; 22.25	A	(1)
4.a.	<p>655</p> <p><i>Possible thinking:</i></p> <ul style="list-style-type: none"> 100 + 400 = 500; 80 + 60 = 140 <i>and</i> 4 + 8 + 3 = 15. 500 + 140 + 15 = 655 	<p>1 mrk: correct</p> <p>1 mrk: valid thinking</p>	NOR	22.24	K	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
4.b.	$6\frac{1}{9}$ <i>Possible thinking:</i> <ul style="list-style-type: none"> $4 + 1 = 5, \frac{2}{3} + \frac{4}{9} = \frac{6}{9} + \frac{4}{9} = 1\frac{1}{9}$ $5 + 1\frac{1}{9} = 6\frac{1}{9}$ $4\frac{2}{3} + 1\frac{4}{9} = 4\frac{6}{9} + 1\frac{4}{9}$ $= 4\frac{6}{9} + 1 + \frac{3}{9} + \frac{1}{9}$ $= 6 + \frac{1}{9}$ 	1 mrk: correct 1 mrk: valid thinking <i>Accept equivalent fractions and improper fractions</i>	NOR	22.22; 22.33; 22.37;	A	(2)
5.	60 <i>Possible thinking:</i> <ul style="list-style-type: none"> $\frac{1}{2} + \frac{1}{8} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} + \frac{1}{8} = \frac{6}{8}$. She will have $\frac{2}{8}$ or $\frac{1}{4}$ left. $R15 \times 4 = R60$ 	1 mrk: correct 1 mrk: valid thinking	NOR	22.30	R	(2)
6.	48 <i>Possible thinking:</i> <ul style="list-style-type: none"> Mandla will eat 24 (double 12) sweets in 5 (half 10) minutes. So in 10 minutes mandla eats $24 \times 2 = 48$ 	1 mrk: correct 1 mrk: valid thinking	NOR		R	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
7.a.	30	1 mrk: correct	PFA	21.34; 22.9; 22.16; 22.20	K	(1)
7.b.	<i>Picture number</i> $\rightarrow \times 4 \rightarrow + 2 \rightarrow$ <i>No. of dots</i>	1 mrk: $\times 4$ 1 mrk: $+ 2$	PFA	22.9; 22.20	K	(2)
7.c.	$2 \times 101 + 2 \times 100 = 402$	1 mrk: Using "Zolile's" formula 1 mrk: correct substitution <i>Note that marks are awarded for method, not for answer.</i>	PFA	22.20; 22.21; 22.29	A	(2)
7.d.	14 <i>Possible thinking:</i> <ul style="list-style-type: none">$58 - 2 \rightarrow 56 \div 4 \rightarrow 14$	1 mrk: correct 1 mrk: valid thinking	PFA		R	(2)
8.a.	$5 + 5 + 4,5 = 14,5$	1 mrk: correct 1 mrk: valid thinking	M	22.53	K	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
8.b.	10 <i>Possible thinking:</i> <ul style="list-style-type: none"> $\frac{1}{2} \text{ of } 2 \times 4 + \frac{1}{2} \text{ of } 3 \times 4 = 4 + 6$ 	1 mrk: correct 1 mrk: valid thinking	M	22.59; 22.60	A	(2)
9.a.	21 <i>Possible thinking:</i> <ul style="list-style-type: none"> $9 \times 3 - 3 \times 2 = 27 - 6 = 21$ $6 \times 3 + 3 \times 1 = 18 + 3 = 21$ $9 \times 1 + 6 \times 2 = 9 + 12 = 21$ 	1 mrk: correct 1 mrk: valid thinking	M	222.56; 2.57	A	(2)
9.b.	24 <i>Possible thinking:</i> <ul style="list-style-type: none"> $2 \times (9 + 3) = 2 \times 12 = 24$ $9 + 3 + 6 + 2 + 3 + 1 = 24$ 	1 mrk: correct 1 mrk: valid thinking	M	22.51; 22.52; 22.53	A	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
10.	9 	1 mrk: correct <i>Learners could draw in the smaller triangles; 3 along each side of larger triangle.</i>	M		R	(1)

To prepare for this assessment, learners should revise from NumberSense Workbooks 21 and 22.

Assessment framework:		Cognitive domain						
		Knowing (K)		Applying (A)		Reasoning (R)		TOTAL
Content area	Number, operations and relationships (NOR)	1(1), 2a(1), 2b(1), 3a(2), 4a(1), 4b(1), 4c(1), 4f(1), 4g(1)	10	2c(1), 3b(2), 4d(1), 4e(1), 4h(1), 5(2), 6(2)	10	7(1), 8(3)	4	24
	Patterns, functions & algebra (PFA)	9a(1), 9b(1)	2	9c(2)	2	10(2)	2	6
	Space & shape (SS)	11a(1), 11b(1)	2	11a(1), 12(2)	3	13(2)	2	7
	Measurement (M)	15(2), 16a(1)	3	14(2), 16b(2)	4	17(2)	2	9
	Data handling (DH)	18a(1), 18b(1)	2	18c(2)	2		.	4
	TOTAL	19		21		10		50

Memo:

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.	5,18	1 mrk: correct	NOR	21.12	K	(1)
2.a.	$\frac{25}{100}$ or $\frac{1}{4}$	1 mrk: all correct <i>Accept all equivalent common fractions</i>	NOR	21.12; 22.11	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
2.b.	0,42	1 mrk: correct	NOR	21.12, 22.11	K	(1)
2.c.	32	1 mrk: correct	NOR	22.4; 22.11	A	(1)
3.a.	$\frac{5}{8}$ <i>Possible explanation:</i> <ul style="list-style-type: none"> Because the number of pieces is the same, but the more pieces something is cut up, the smaller each piece will be. Could draw a number line with eighths and twelfths accurately marked. Could draw 2 “wholes” of the same size, accurately cut into eighths and twelfths and shade the correct pieces. $\frac{5}{8} = \frac{15}{24}$ and $\frac{5}{12} = \frac{10}{24}$; $15 > 10$ 	1 mrk: correct 1 mrk: valid explanation <i>The last example, although correct, shows little understanding and could suggest that learners are simply memorising procedures without thinking.</i>	NOR	22.11	K	(2)
3.b.	$\frac{4}{25}$ <i>Possible explanation:</i> <ul style="list-style-type: none"> $\frac{4}{25} = 16\%$ and $\frac{3}{20} = 15\%$. $16\% > 15\%$ $\frac{4}{25} = \frac{16}{100}$ and $\frac{3}{20} = \frac{15}{100}$. $16 > 15$ 	1 mrk: correct 1 mrk: valid explanation	NOR	22.12	A	(2)

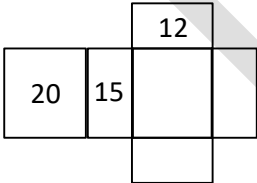
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
4.a.	719	1 mrk: correct	NOR	21.2; 21.8; 21.17	K	(1)
4.b.	37,80	1 mrk: correct	NOR	22.2	K	(1)
4.c.	2	1 mrk: correct	NOR	21.26	K	(1)
4.d.	$\frac{3}{16}$	1 mrk: correct	NOR	21.26; 21.33; 22.30; 22.35	A	(1)
4.e.	48	1 mrk: correct	NOR	21.1	A	(1)
4.f.	180	1 mrk: correct	NOR	21.1; 21.19; 21.25; 22.14	K	(1)
4.g.	50412	1 mrk: correct	NOR	21.25; 21.27	K	(1)
4.h.	29	1 mrk: correct	NOR	22.7; 22.25	A	(1)

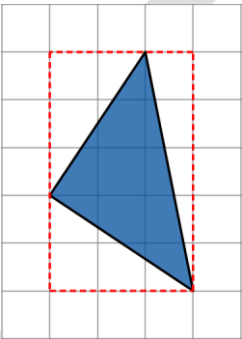
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
5.	$2\frac{7}{8}$ or $1\frac{5}{16}$ <i>Possible thinking:</i> <ul style="list-style-type: none"> $5\frac{1}{2} = 5\frac{4}{8} - 2\frac{5}{8} = 5\frac{4}{8} - 2\frac{4}{5} - \frac{1}{8}$ $= 3 - \frac{1}{8}$ $= 2\frac{7}{8}$ $5\frac{1}{2} = 5\frac{4}{8} - 2\frac{5}{8} = 5\frac{7}{8} - 3 = 2\frac{7}{8}$ 	1 mrk: correct 1 mrk: valid thinking	NOR	22.30; 22.35	A	(2)
6.	9 <i>Possible thinking:</i> <ul style="list-style-type: none"> $1\frac{2}{3} + 1\frac{2}{3} \rightarrow 3\frac{1}{3} + 1\frac{2}{3} \rightarrow 5$. 3 bicycles can be made with 5 m, so 3×3 can be made with 15m 	1 mrk: correct 1 mrk: valid thinking	NOR	22.19	A	(2)
7.	$3 \times 3 - 3 + 3 = 3$	1 mrk: correct	NOR	22.7; 22.25	R	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
8.	<p>36</p> <p><i>Possible thinking:</i></p> <ul style="list-style-type: none"> <i>Guess and check: Since $10 \times 11 = 110$ (much too small) and $100 \times 101 = 10100$ (much too big), start somewhere inbetween.</i> <p>$50 \times 51 = \text{half } 5100 = 2550$ (too big)</p> <p>$20 \times 21 = \text{double } 210 = 420$ (too small)</p> <p>$30 \times 31 = 930$ (too small)</p> <p>$40 \times 41 = \text{double } 820 = 1640$ (too big, but between 30 and 40)</p> <p>$36 \times 37 = 36 \times 30 + 36 \times 7$ $= 30 \times 30 + 6 \times 30 + 30 \times 7 + 6 \times 7$ $= 900 + 180 + 210 + 42$ $= 1332$</p>	<p>1 mrk: evidence of logical guessing and checking</p> <p>1 mrk: valid thinking for 36×37</p> <p>1 mrk: page 36 correct</p>	NOR		R	(3)
9.a.	39	1 mrk: correct	PFA	21.6; 21.15; 21.28; 21.34; 22.16	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
9.b.	$4 \times 5 - 4 + 3 = 19$	1 mrk: correct	PFA	21.6; 21.34; 22.16; 22.20; 22.21	K	(1)
9.c.	$4 \times 51 - 4 + 49 = 204 - 4 + 49$ $= 249$	1 mrk: correct formula 1 mrk: correct substitution <i>Note that marks are awarded for thinking not answer.</i>	PFA	21.7; 21.35; 22.21; 22.29	A	(2)
10.	2550 <i>Possible thinking:</i> <ul style="list-style-type: none"> $50 \times 50 + 50$ 50×51 	1 mrk: correct 1 mrk: valid thinking	PFA	21.28	R	(2)
11.a.	Pentagonl-based pyramid and hexahedron	1 mrk: pyramid 1 mrk: hexahedron <i>If both marks are awarded, delete 1 mrk for each extra selected (t a max of 2)</i>	SS	22.40; 22.44	K & A	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
11.b.	6	1 mrk: correct	SS	22.40; 22.41; 22.42	K	(1)
12.a.	False The diagonals of a parallelogram are not always equal OR The diagonals of a parallelogram bisect each other	1 mrk: correct <i>Note that this mark should only be awarded with a correction.</i>	SS	21.44; 21.45; 21.46	A	(1)
12.b.	True	1 mrk: correct	SS	21.39; 21.41; 21.42; 21.46	A	(1)
13.	16 <i>Possible thinking:</i> <ul style="list-style-type: none"> 5; 8; 11; 14; 17; 20; 23; 26; 29; 32; 35; 38; 41; 44; 47; 50 50 – 2 faces at beginning and end of row = 48 faces. 48 faces ÷ 3 (front, top and back) = 16 	1 mrk: correct 1 mrk: valid thinking	SS (and PFA)		R	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
14.	07:45 or 7:45 am <i>Possible thinking:</i> <ul style="list-style-type: none"> • $8 + 2 = 10$ hours behind. $17:45 - 10\text{hrs} = 07:45$ • $17:45 - 2\text{hrs} = 15:45$ at UTC and $15:45 - 8 = 07:45$ in LA 	1 mrk: correct 1 mrk: valid thinking	M	21.50; 21.51	A	(2)
15.	Perimeter = 12 cm Area = 8 cm^2	1 mrk: perimeter correct 1 mrk: area correct	M	22.52; 22.53; 22.56; 22.57	K	(2)
16.a.	60	1 mrk: correct	M	22.61; 22.62; 22.63; 22.64	K	(1)
16.b	94 <i>Possible thinking:</i> <ul style="list-style-type: none"> • <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;">  </div> <div style="margin-left: 20px;"> $2 \times (20 + 15 + 12)$ $= 2 \times 47$ $= 94$ </div> </div> • $2 \times 4 \times 3 + 2 \times 4 \times 5 + 2 \times 3 \times 5 = 24 + 40 + 30 = 94$ 	1 mrk: correct 1 mrk: valid thinking	M		A	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
17.	$6\frac{1}{2}$ or 6,5 <i>Possible thinking:</i> <ul style="list-style-type: none"> Area of outer rectangle = 15 sq units. $15 - \frac{1}{2} \text{ of } 3 \times 2 - \frac{1}{2} \text{ of } 2 \times 3 - \frac{1}{2} \text{ of } 1 \times 5$ $= 15 - 3 - 3 - 2\frac{1}{2}$ $= 6\frac{1}{2}$ 	1 mrk: correct 1 mrk: valid thinking	M	22.59; 22.60	R	(2)
18.a	166	1 mrk: correct	DH	21.59	K	(1)
18.b.	164	1 mrk: correct	DH	21.61	K	(1)
18.c.	No change and New median is 165	1 mrk: each correct	DH	21.59; 21.61	A	(2)