

NumberSense Assessment Portfolio – Grade 4

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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. Fundi sells soccer balls for R86 each. She makes this table to help her calculate the price when selling the balls.

No. of balls	2	5	7	10	30	50	60
Cost (R)	172	430	602	860	2 580	4 300	5 160

Show how you can use Fundi's table to calculate 67×86 .

(3)

2. Jan, Ferial and Themba are making pictures with dots. For each child, their pictures make a pattern. Study the pictures and the patterns they make and answer the questions that follow.

Jan's pattern:



Picture 1



Picture 2



Picture 3

Picture 4

Ferial's pattern:

Picture 1



Picture 2



Picture 3

Picture 4

Themba's pattern:

Picture 1



Picture 2



Picture 3

Picture 4

- a. Draw the fourth picture in each pattern. (3)
- b. Complete the table.

Picture number	1	2	3	4	5	6	8	10
No. of dots in Jan's picture	5	9			21			
No. of dots in Ferial's picture	4	8			20			
No. of dots in Themba's picture	5	8						

(5)

- c. Sindi, Vusi and Dan are discussing how they determined the number of dots in Picture 10 of Jan's pattern.



Sindi

I double the number of dots in Picture 5 because double 5 is 10.

c.

I noticed that the number of dots increases by 4 for each picture number. There are 5 pictures from Picture 5 to Picture 10 so I added 5×4 dots to the 21 dots in Picture 5.



Vusi



Dan

I noticed that each picture had 1 dot in the middle and four lines of dots. Picture 3 has one dot in the middle and 4 lines of 3 dots. So, Picture 10 will have one dot in the middle and 4 lines of 10 dots.

For each method, say whether or not it is correct and explain why you say so.

(3)

- d. Sindi's method can be used to calculate the number of dots in Picture 10 of Ferial's pattern. Show this calculation.

(1)

- e. How many dots will there be in picture 12 of each pattern? Show your thinking.

(6)

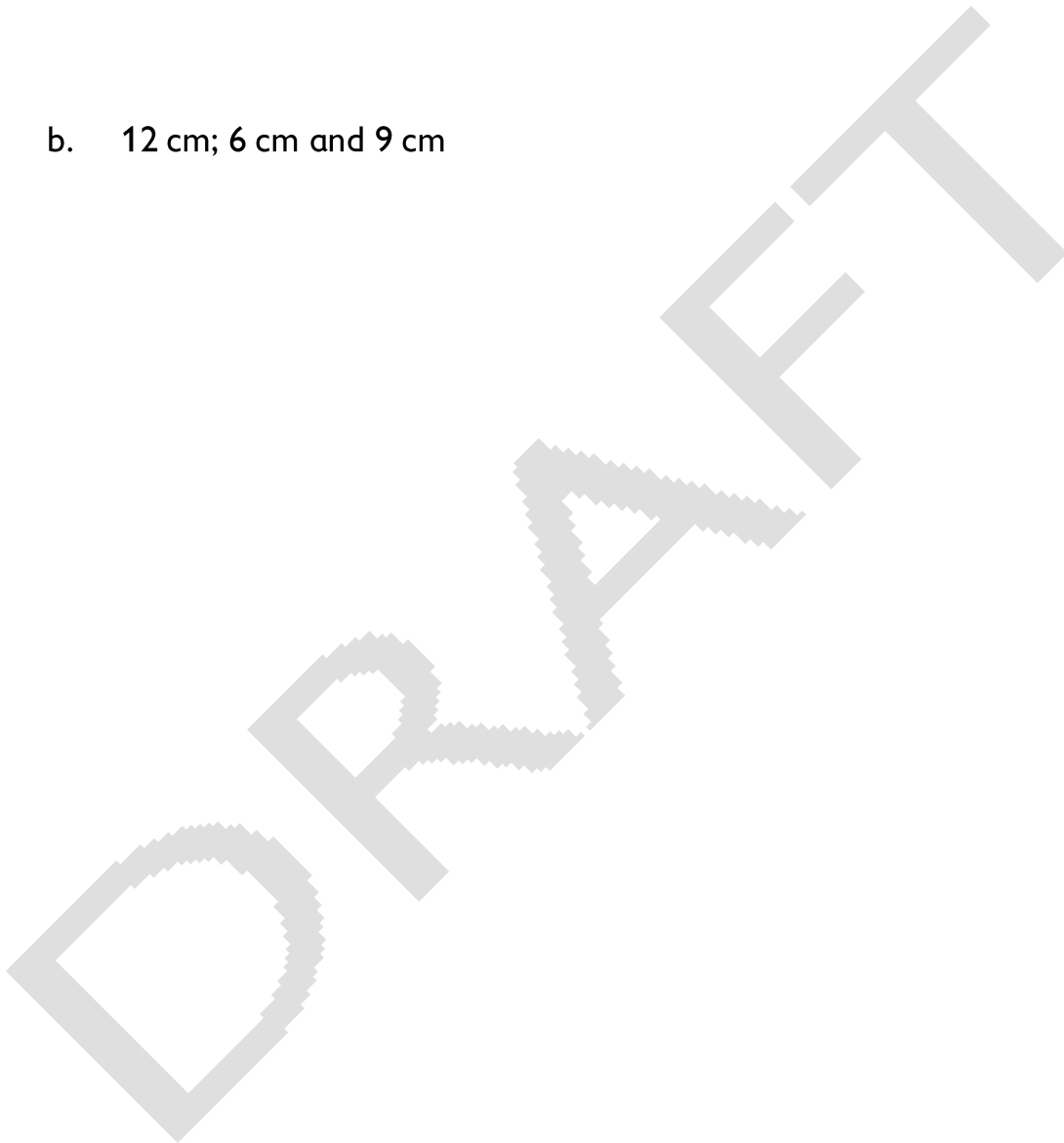
3. Andrew is making decorations. He joins three sticks together at their ends. For each set of sticks, determine whether or not they would make a triangle when joined at their ends. Explain why you say so.

a. 5 cm, 10 cm and 3 cm

(2)

b. 12 cm; 6 cm and 9 cm

(2)



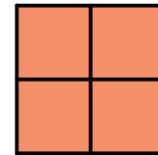
Investigation

How enlarging a shape by lengthening the sides affects the area of the shape

Instructions:

- Complete this investigation in class working alone.
- You will need:
 - glue
 - a pair of scissors
 - card
 - paper
- You may use your NumberSense Workbook or any other notes to help you.
- This investigation is for 25 marks.
- Time allocation: 2 hours

1. Zoliswa has square tiles. She joins them together to make a new square like this:

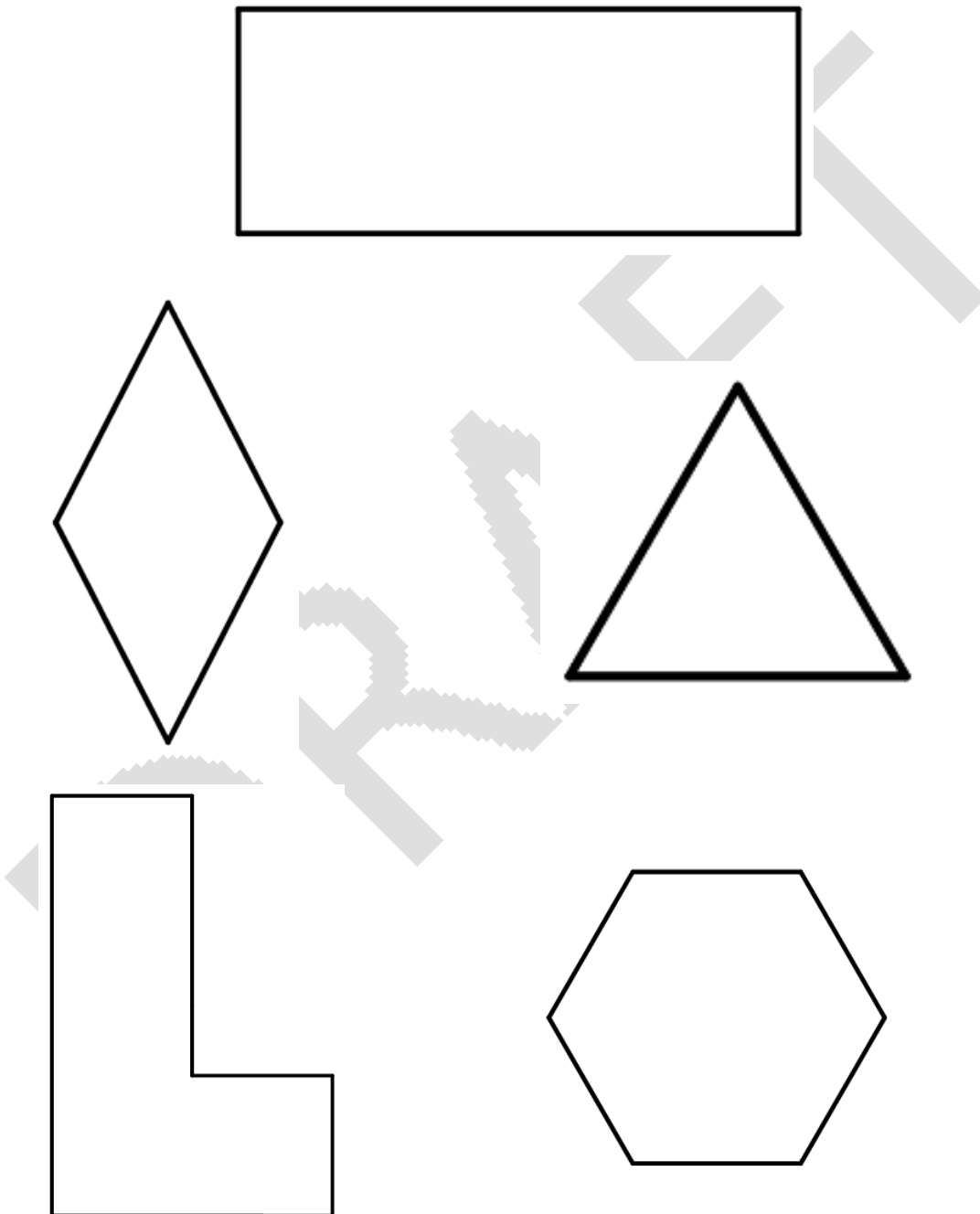


I noticed that I used four squares to make a larger square, so the area of my larger square is 4 times the smaller square, but the sides of my smaller square are only double the length of the smaller square.

Investigate if the same is true for other shapes by completing the following:

The shapes below all have sides that are double the length of the tiles that you have already cut out. Use the tiles to prove that the area of the enlarged shape is 4 times the smaller shape. (*Hint: You may need cut the regular hexagon to get it to fit the enlarged hexagon*).

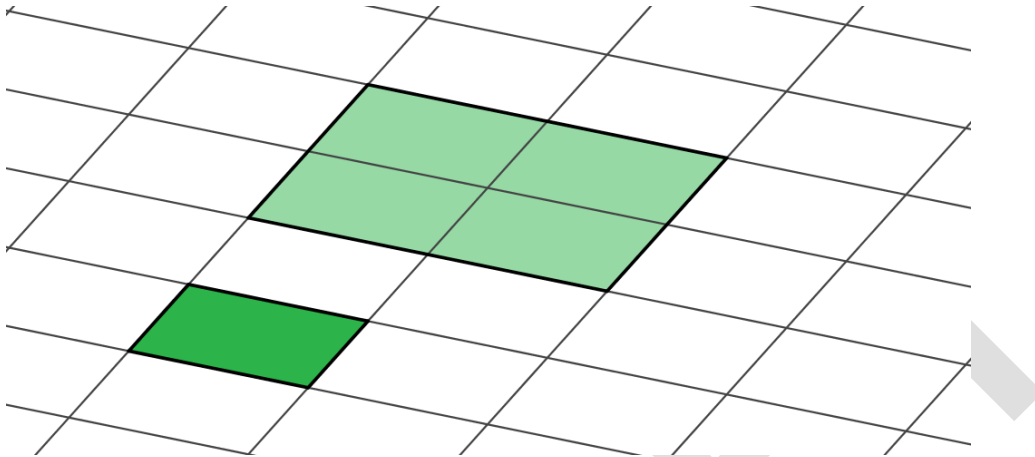
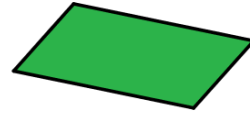
Stick your shapes here:



(10)

2. Zoliswa then tessellates this quadrilateral.

On her tessellation, she marks another quadrilateral that has sides double the length of her original quadrilateral.

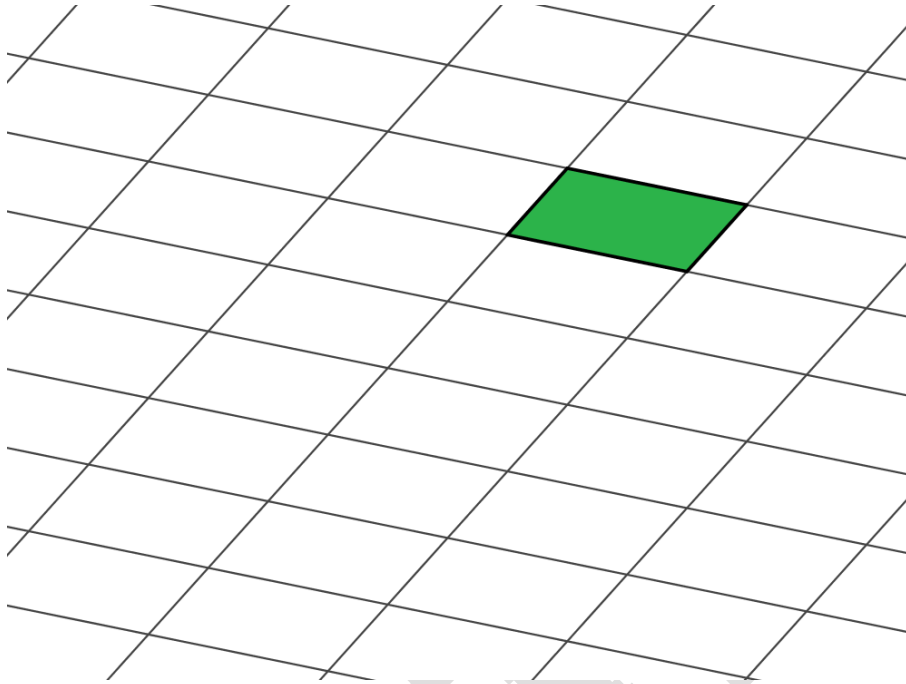


- a. Are the lengths of the sides of the enlarged quadrilateral double the lengths of the sides of the original quadrilateral? Explain. (1)
- b. Is the area of the enlarged quadrilateral 4 times the area of the original quadrilateral? Explain. (1)

You have now shown, for many shapes, that when a shape is enlarged by doubling the length of all its sides, the area of the enlarged shape is 4 times the area of the original shape. In later years, you will be able to use algebra to prove that this is the case for all shapes.

3. But what happens if a shape is enlarged by increasing the length of its sides by 3 times? Will the area of the enlargement still be 4 times the area of the original shape? Or will it be 6 times the area of the enlargement? Investigate by answering the questions below.

- a. Mark an enlarged quadrilateral on Zoliswa's tessellation that has sides 3 times the length of the sides of the original quadrilateral.

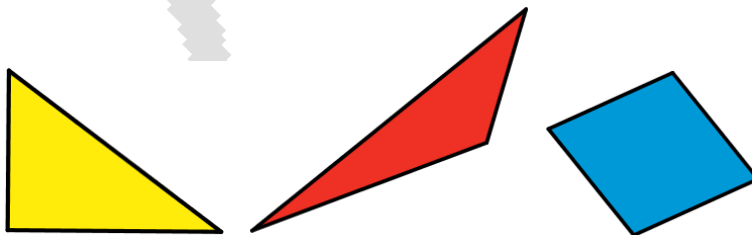


(1)

- b. How many times larger is the area of the enlarged quadrilateral than the original quadrilateral?

(1)

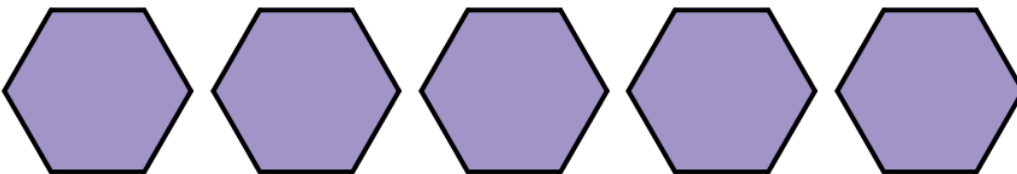
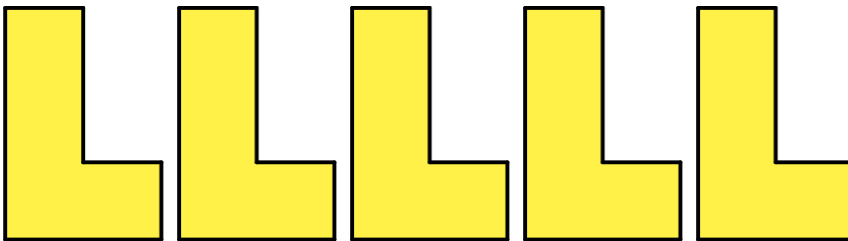
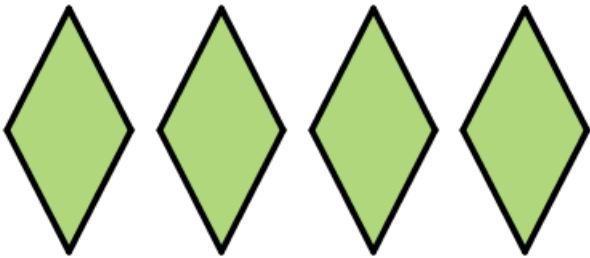
4. a. Tessellate the following three shapes in such a way that you can mark at least one enlargement of each shape with sides 3 times longer than the original shape. Hand in one page for each one with the enlarged shapes marked.



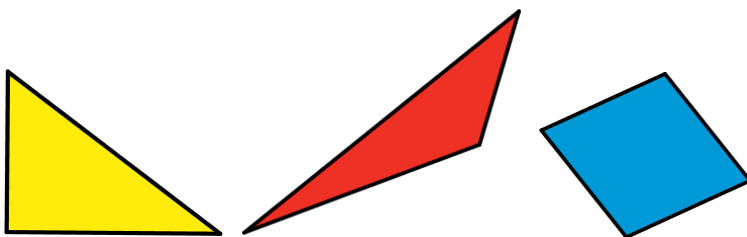
(9)

- b. What can you conclude about the area of the enlarged shape when the lengths of the sides are 3 times longer than the length of the original sides? Explain.

(2)



These following three shapes should be stuck on card and cut out to create tiles.



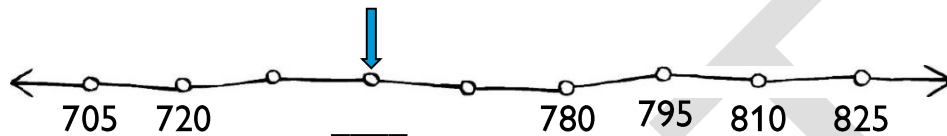
Name: _____

Class: _____

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

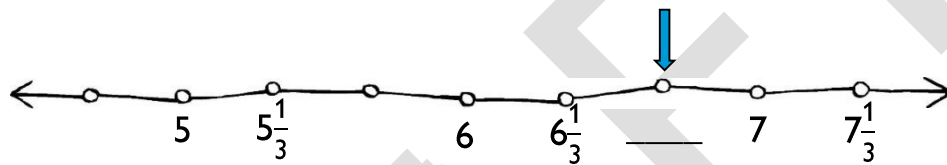
1. Determine the values indicated by the arrows.

a.



(1)

b.



(1)

2. Complete. Fill in the answer only.

a. $83 + 9 =$ _____ (1)

b. $4\,000 + 2\,000 =$ _____ (1)

c. $75 + 76 =$ _____ (1)

d. $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} =$ _____ (1)

e. Double 350 = _____ (1)

f. $6 \times 7 =$ _____ (1)

3. Calculate. *Show your thinking.*

a) $427 + 56$

(2)

b) $145 + 70 + 55 + 230$

(2)

4. Five friends share 11 chocolate bars equally so that there is nothing left over.



a. Draw a simple picture to show them how to do it.

(2)

b. How much chocolate bar does each friend get?

_____ chocolates (1)

5. Mrs Shonga needs $\frac{1}{5}$ metre of fabric to make a pencil bag. How many pencil bags can she make with 3 metres of fabric? Show your thinking.

_____ pencil bags (2)

6. $48 \times 361 = 17\,328$

Use the correct expression above to complete.

$24 \times \underline{\hspace{2cm}} = 17\,328.$

Explain your thinking.

(2)

7. Patrick makes pictures with dots like this. The first four pictures make a pattern.

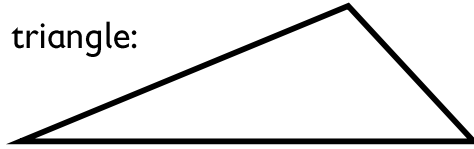


- a) Draw the fifth picture in the pattern. (1)
- b) Complete the table.

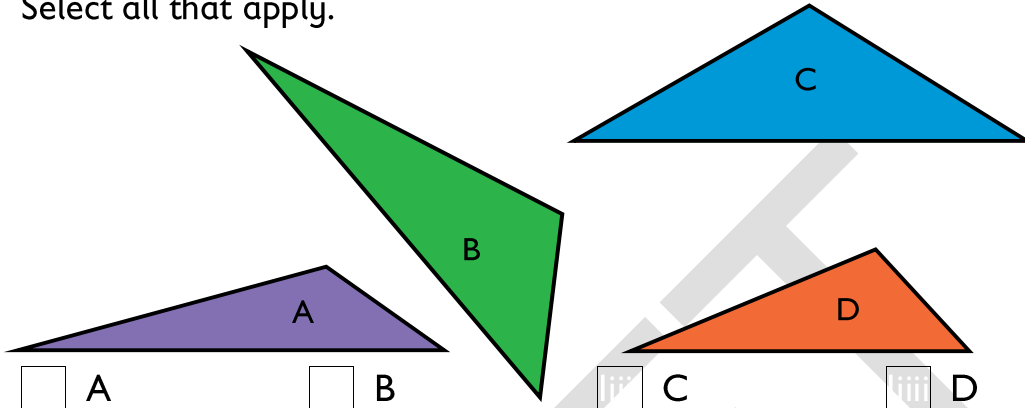
Picture number	1	2	3	4	5	6
Number of dots	5	7	9	11		

(1)

8. Lerato drew this triangle:



- a. Which of these shapes are the same as Lerato's triangle?
Select all that apply.


☐ A

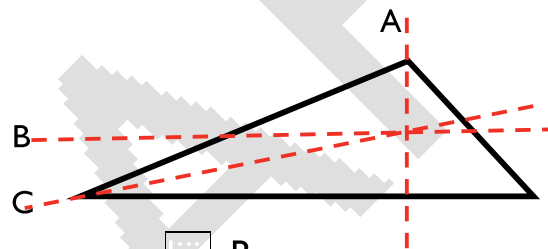
☐ B

☒ C

☒ D

(1)

- b. Which lines drawn on Lerato's triangle are lines of symmetry?
Select all that apply.


☐ A

☒ B

☐ C

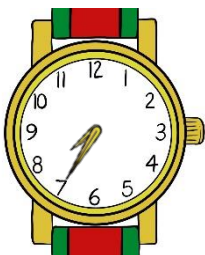
☒ No lines of symmetry

(1)

- c. Lerato claims that the length of the sides of her triangle are: 6 cm, 3 cm and 2 cm. Explain how you know that Lerato is incorrect without using a ruler to measure the length of the sides.

(2)

9. What time is shown on this watch?



(1)

10. What is the digital 24-hour time for:

a. 20 to 7 in the morning? _____ (1)

b. 9:10 pm? _____ (1)

11. A clock loses time at 3 minutes per hour. It is set correctly at 13:00. What time will the clock show when the correct time is 18:00 on the same day? Show your thinking.

_____ (2)

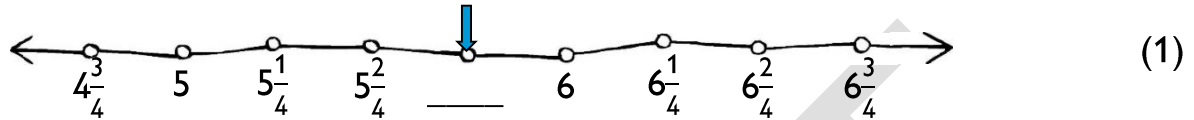
DRAFT

Name: _____

Class: _____

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

1. Determine the value indicated by the arrow.



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

a. $235 + 45 =$ _____ (1)

b. $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} =$ _____ (1)

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

d. $26 - 18 =$ _____ (1)

e. $600 -$ _____ $= 550$ (1)

f. $5 \times 6 =$ _____ (1)

g. $\frac{2}{3} \times 2 =$ _____ (1)

3. Calculate. *Show your thinking.*

$$360 - 135$$

(2)



4. Books are sold for R48 each.

a. What will 5 books cost?

R_____ (1)

b. What will 30 books cost?

R_____ (1)

c. What is 35×48 ? Show your thinking.

(2)

5. $\frac{3}{10}$ is a common fraction. Write $\frac{3}{10}$ as a decimal fraction.

_____ (1)

6. Mr Sibuya worked for 5 weeks and was paid R5 000. How much money did he earn per week?

R_____ (1)

7. Peter and Abdul together have 96 marbles. If Peter has twice as many marbles as Abdul, how many marbles does Abdul have? Show your thinking.

_____ marbles (2)

8. Four children play tennis. Each child plays each of the others once. How many matches are played? Show your thinking.

_____ matches (2)

9. Luthando makes pictures with matches like this. The first four pictures make a pattern.



Picture 1



Picture 2



Picture 3



Picture 4

- a. Draw the fifth picture in the pattern.

(1)

- b. Complete the table.

Picture number	1	2	3	4	5	8
Number of matches	4	6	8	10		

(1)

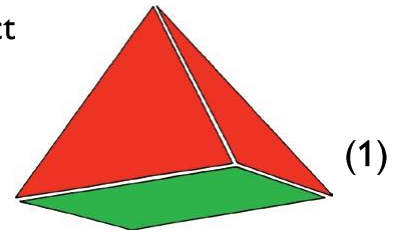
- c. How many matches will there be in picture 20? Explain your thinking.

_____ matches (2)

10. a. Is this polyhedron a prism or a pyramid? Select the correct option.

☐ prism

☐ pyramid



(1)

- b. How many edges does this polyhedron have?

_____ edges (1)

- c. Select the net(s) that can be folded to make this polyhedron. Tick all the correct options.

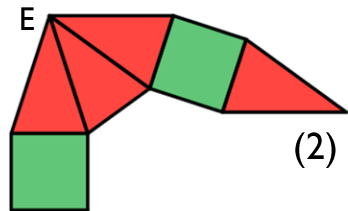
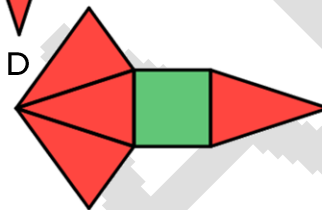
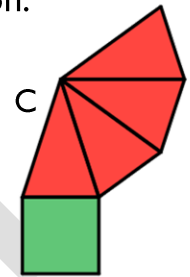
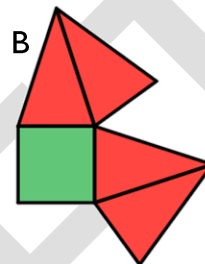
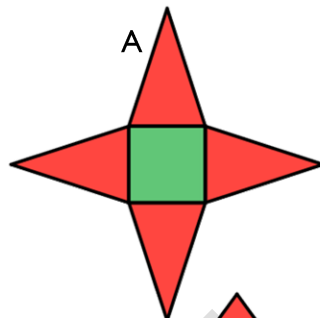
☐ A

☐ B

☐ C

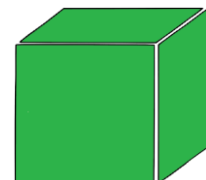
☐ D

☐ E



(2)

11. a. What is the name of this polyhedron?

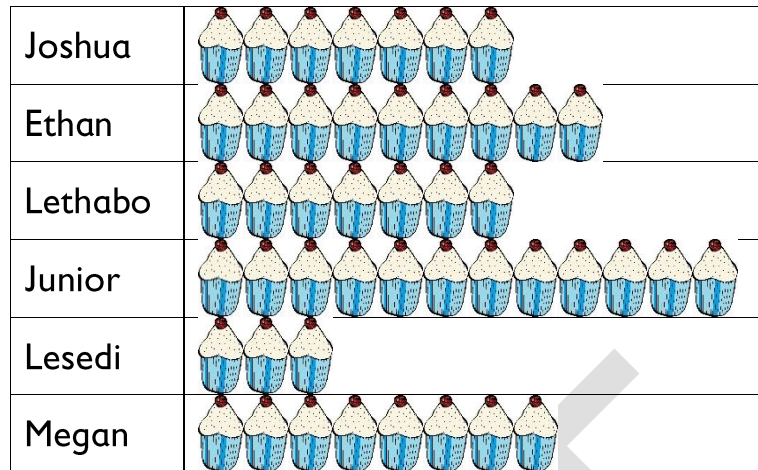


(1)

- b. What is the smallest number of colours needed to paint the faces of this polyhedron in such a way that faces that touch each other are not painted the same colour?







_____ colours (1)

12. Joshua and friends sell cupcakes. For each cupcake that they sell, they add a sticker to the pictograph.



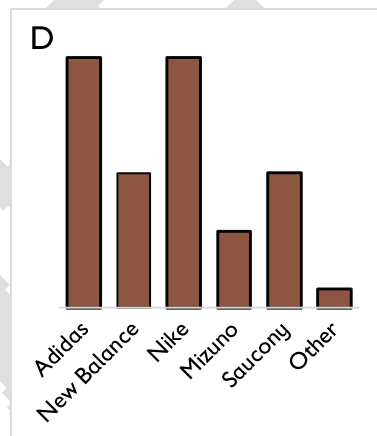
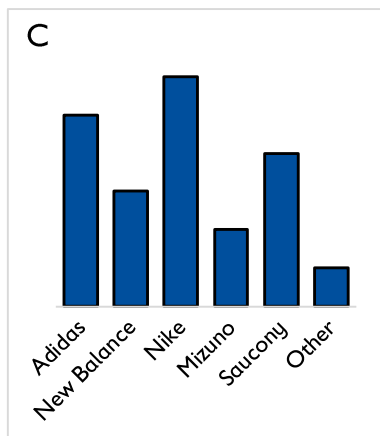
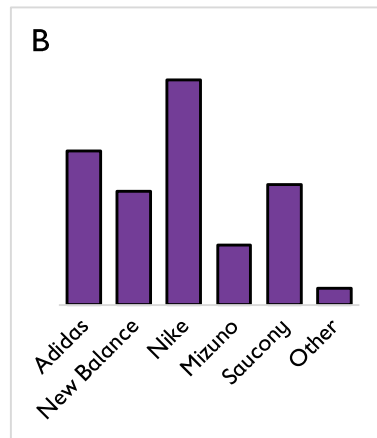
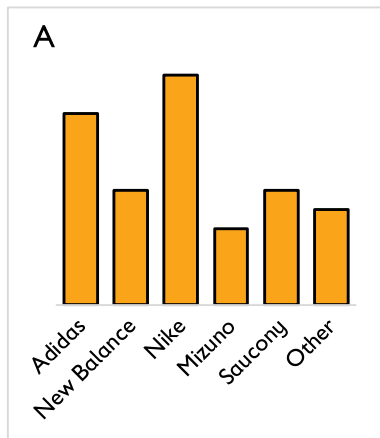
- a. How many cupcakes has Ethan sold? _____ cupcakes (1)
- b. Megan sells her cupcakes for R15 each. How much money has Megan collected for cupcakes? R_____ (1)

13. Loyiso wanted to know which brand of running shoe is most popular. He completed a tally at a local race.

Adidas	
New Balance	
Nike	
Mizuno	
Saucony	
Other	

- a. What was the most popular brand of running shoe at the race? _____ (1)
- b. How many runners were wearing Mizuno running shoes? _____ runners (1)

- c. Which graph most accurately reflects the data that Loyiso collected? Tick the best one. *Note that all of the graphs have a bar missing for the number of runners wearing New Balance.*


☐ **A**
☐ **B**
☐ **C**
☐ **D**
(1)

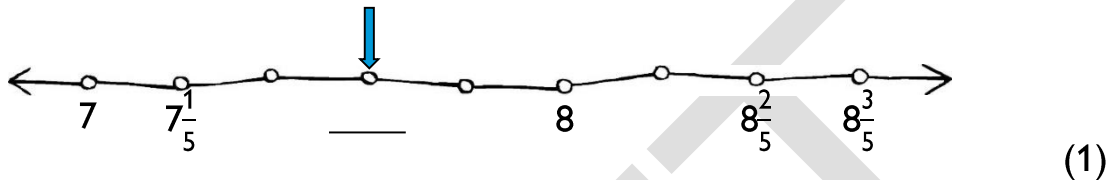
Name: _____

Class: _____

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

1. Determine the values indicated by the arrows.

a.



5. Calculate. *Show your thinking.*

a. $155 + 180 + 245 + 20$

(2)

b. $215 - 88$

(2)

6. Mr David works for R45 per hour. Determine how much he should get paid for 15 hours of work. *Show your thinking.*

R_____ (2)

7. There are 24 children in a class. One sixth of the class wear glasses. How many children wear glasses? (1)

_____ children

8. Andrew eats 1-eighth of a pizza and Luthando eats 1-sixth of the same size pizza. Who eats more pizza, Andrew or Luthando? Explain.

(2)

9. Mr Shonga needs $\frac{2}{5}$ of a bag of fertilizer for one vegetable patch. He buys 3 bags of fertilizer.

a. How many vegetable patches can he fertilize? Show your thinking.

_____ vegetable patches (2)

b. How much fertilizer is left over?

_____ bags of fertilizer (1)

10. Which number is exactly half way between 64 and 96? Show your thinking.

(2)

11. Fundi makes pictures with dots like this. The first four pictures make a pattern.



a) Draw the fifth picture in the pattern. (1)

b) Complete the table.

Picture number	1	2	3	4	5	8
Number of dots	3	5	7	9		

(1)

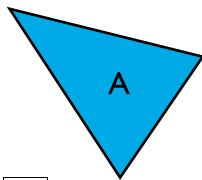
- c) How many dots will there be in picture 12? Explain your thinking.

_____ dots (2)

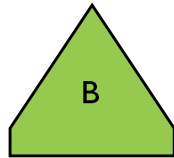
- d) Which picture number will have 37 dots? Explain your thinking.

Picture _____ (2)

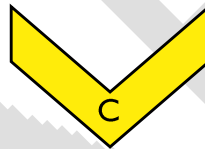
12. Which shapes are triangles? Tick all that apply.



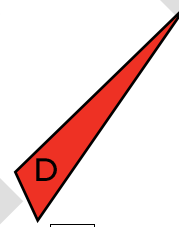
☐ A



☐ B



☐ C



☐ D

(1)

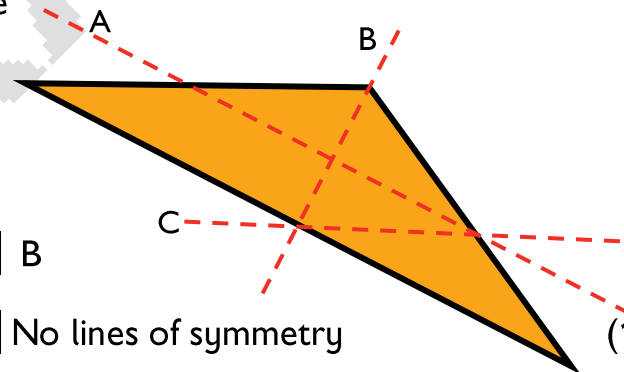
13. Which lines drawn on this triangle are lines of symmetry? Select all that apply.

☒ A

☐ B

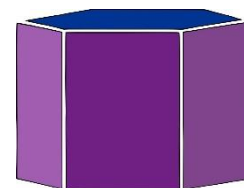
☐ C

☐ No lines of symmetry







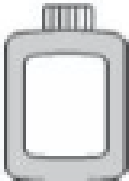
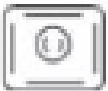
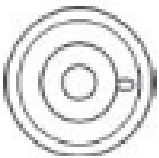

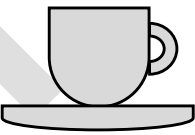
(1)

14. This object is a hexagonal-based prism. What shape are its faces and how many of each shape face does it have?



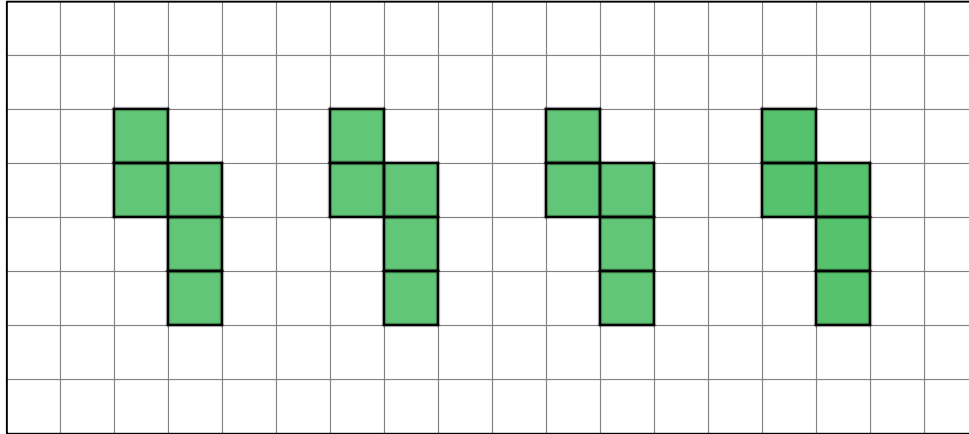
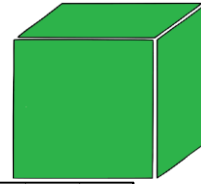
(2)

15. Study the images and match the object with its correct side view and top view. Write B – F in the correct cell in the table. One is done for you.

 A bottle	 Cup and saucer	 Container
A 	B 	C 
D 	E 	F 

	Side view	Top view
A bottle	E	
Cup and saucer		
Container		

16. The images on the grid, show incomplete nets that can be folded to make a cube. Draw the missing face in a different position on each of the nets.



(2)

17. Complete.

We say	Analogue time	24-hour time
20 past 5 in the evening		
	7:55 am	07:55

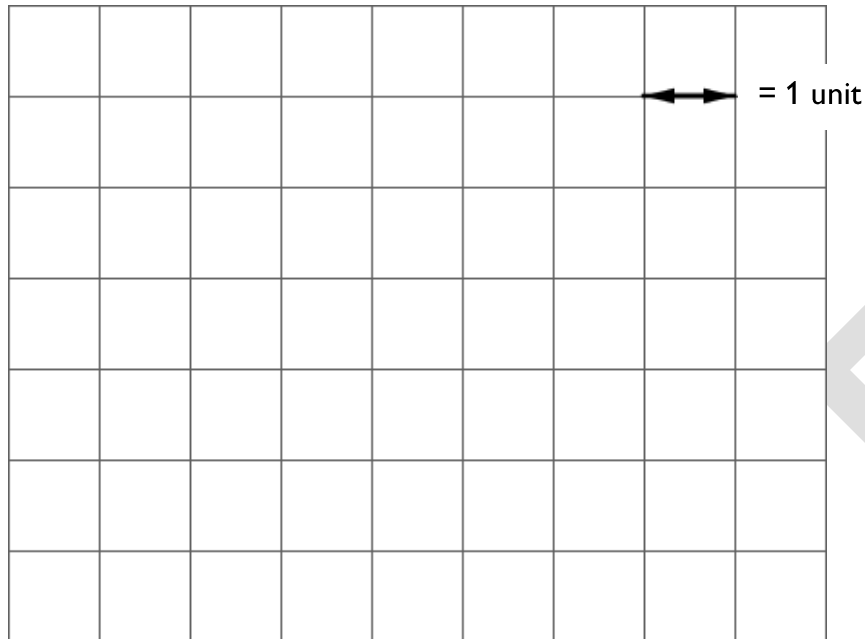
(3)

18. Use a ruler to measure the length of the pencil.



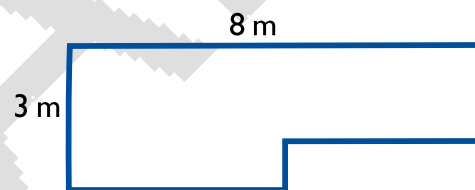
Complete. _____ cm + _____ mm (2)

19. Draw a shape on the grid that has a perimeter of 14 units.



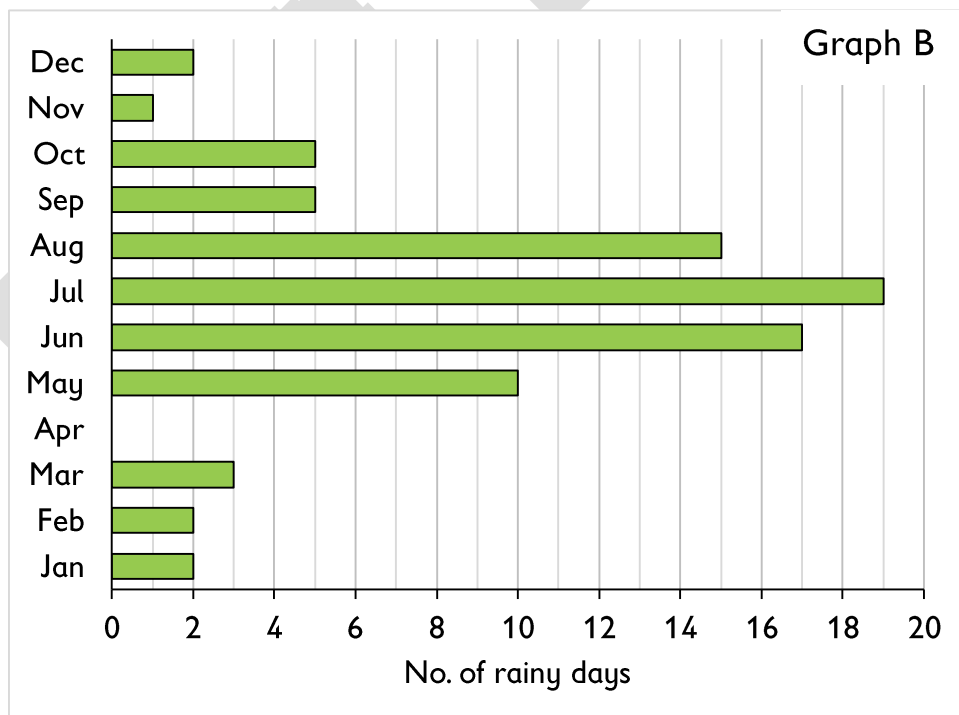
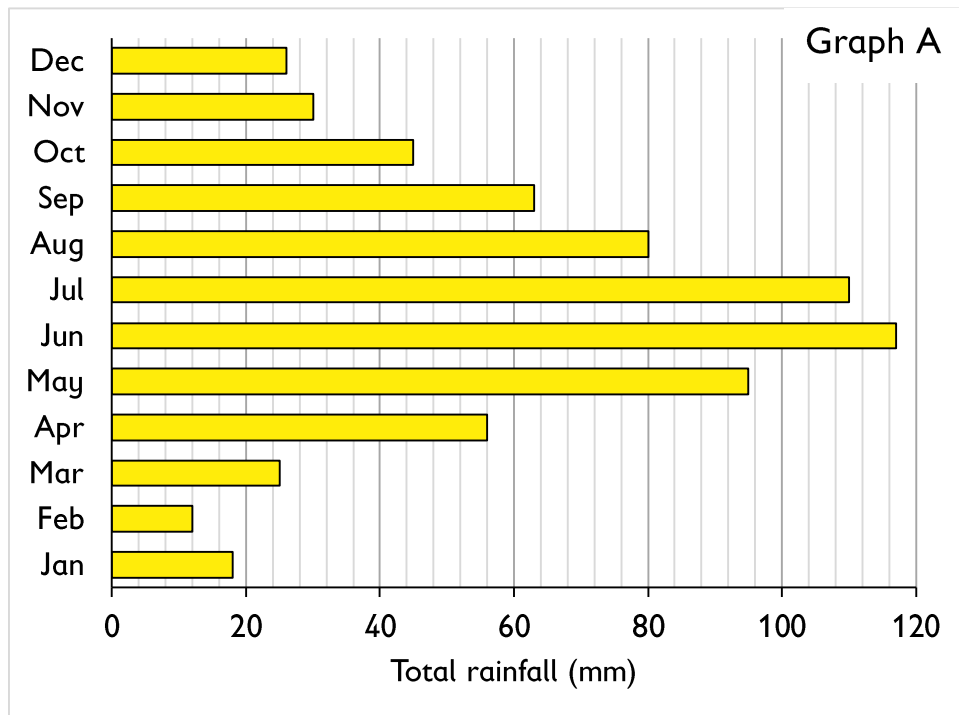
(2)

20. An ant walks once around this rectangular figure once, all along the lines. How far did the ant walk? Show your thinking.



_____ m (2)

21. Two graphs showing the monthly rainfall in Cape Town are given. Graph A shows the total amount of rain measured in millimetres that fell each month. Graph B shows on how many days in the month it rained.



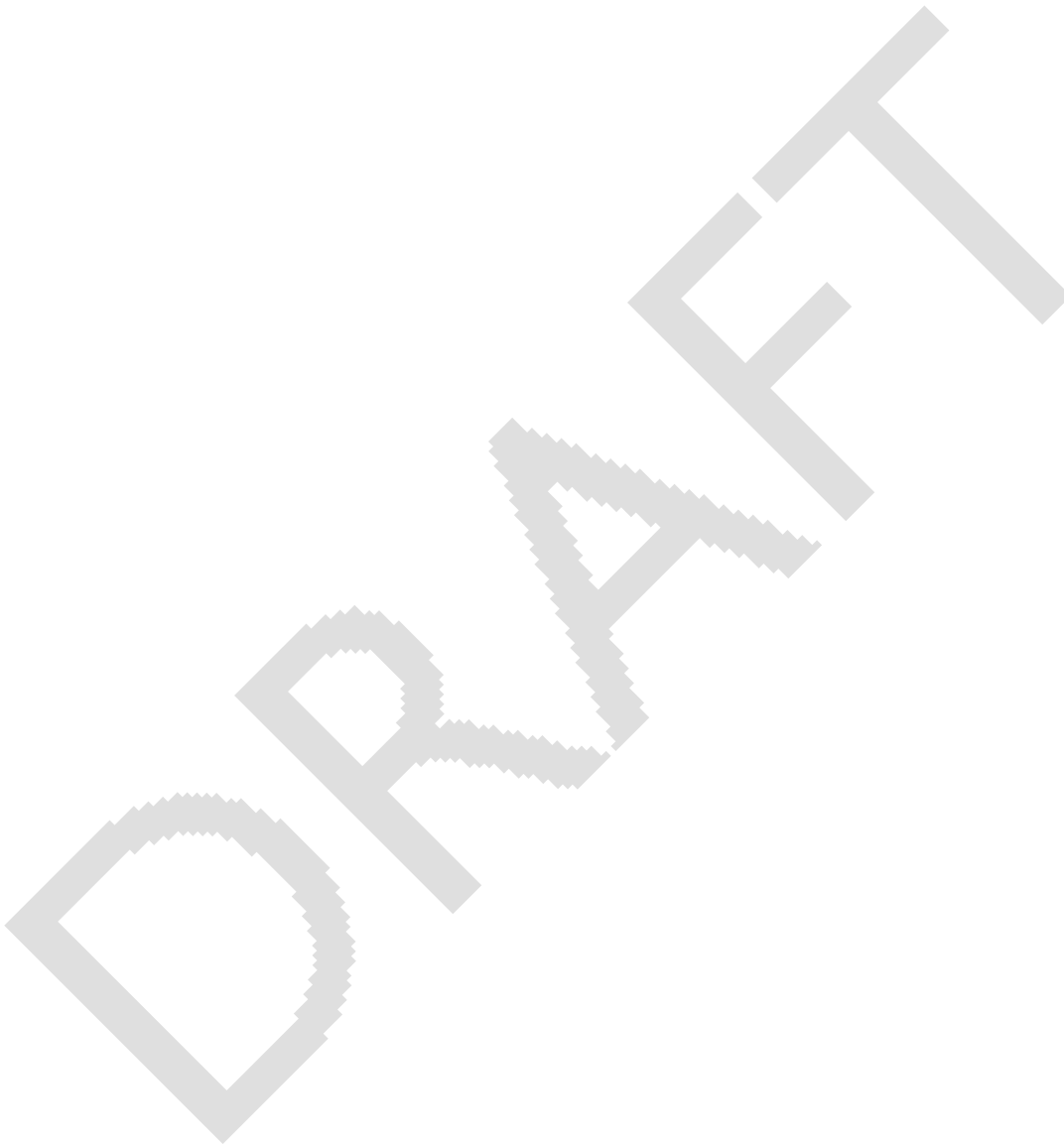
a. There were 5 days that it rained in Cape Town in April.
Complete Graph B to include this information. (1)

b. Which graph, A or B, would you use to determine whether more rain fell in June or July? Select one.

☐ A

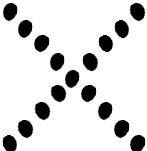

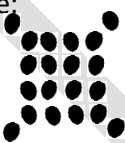
☐ B

(1)



To prepare for this assessment, learners should have completed NumberSense Workbook 13, pages 1 – 45.

Memo:

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.	$67 = 60 + 7$ From table: $60 \times 86 = 5160$ and $7 \times 86 = 602$ $5160 + 602 = 5762$	1 mrk: breaking up 67 into 60 and 7 1 mrk: selecting correct values from table 1 mrk: accuracy in addition	NOR	13.4; 13.14; 13.38	A	(3)
2a.	Jan's 4 th picture:  Ferial's 4 th picture:  Themba's 4 th picture: 	1 mrk: EACH correct	PFA	13.16; 13.20; 13.26	K	(3)

Ques	Correct solution(s)									Comment	Content area	Page ref.	Cognitive domain	Mark allocation																																				
2.b.	<table><tr><td>Pic. no.</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>8</td><td>10</td></tr><tr><td>No. of dots - J</td><td>5</td><td>9</td><td>13</td><td>17</td><td>21</td><td>25</td><td>33</td><td>41</td></tr><tr><td>No. of dots - F</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>32</td><td>40</td></tr><tr><td>No. of dots - T</td><td>5</td><td>8</td><td>13</td><td>20</td><td>29</td><td>40</td><td>68</td><td>104</td></tr></table>									Pic. no.	1	2	3	4	5	6	8	10	No. of dots - J	5	9	13	17	21	25	33	41	No. of dots - F	4	8	12	16	20	24	32	40	No. of dots - T	5	8	13	20	29	40	68	104	1 mrk: No. of dots in Pictures 3 & 4 correct; i.e. values in red 1 mrk: No. of dots in Themba’s Pictures 5 & 6 correct; i.e. values in purple 1 mrk: No. of dots in Jan’s Pictures 6; 8 & 10 correct; i.e. values in blue 1 mrk: No. of dots in Ferial’s Pictures 6; 8 & 10 correct; i.e. values in green 1 mrk: No. of dots in Themba’s Pictures 6; 8 & 10 correct; i.e. values in orange	PFA	13.16; 13.20; 13.26; 13.31; 13.36	A	(5)
	Pic. no.	1	2	3	4	5	6	8	10																																									
	No. of dots - J	5	9	13	17	21	25	33	41																																									
	No. of dots - F	4	8	12	16	20	24	32	40																																									
	No. of dots - T	5	8	13	20	29	40	68	104																																									
2.c	Sindi is incorrect, because double 21 is 42 and there are only 41 dots in Picture 10. Vusi is correct, because $21 + 5 \times 4 = 21 + 20$ which is 41. Dan is correct, because $10 \times 4 + 1 = 41$									1 mrk: each correct with valid reason	PFA	13.36	R	(3)																																				

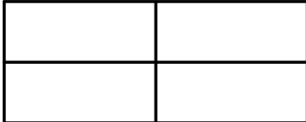

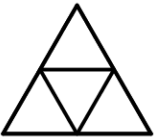
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
2.d	Double $20 = 40$ Or $20 \times 2 = 40$	1 mrk: correct	PFA		R	(1)
2.e.	<u>Jan's pattern:</u> 49 <i>Possible thinking:</i> <ul style="list-style-type: none"> • $41 + 4 + 4$ • $41 + 2 \times 4$ • $12 \times 4 + 1$ <u>Ferial's pattern:</u> 48 <i>Possible thinking:</i> <ul style="list-style-type: none"> • $40 + 4 + 4$ • $40 + 2 \times 4$ • 12×4 <u>Themba's pattern:</u> 148 <i>Possible thinking:</i> <ul style="list-style-type: none"> • $104 + 21 + 23$ • $12 \times 12 + 4$ 	1 mrk: each correct number of dots 1 mrk: each valid thinking	PFA	13.36	A	(6)

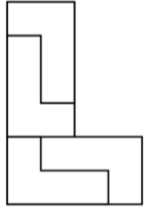
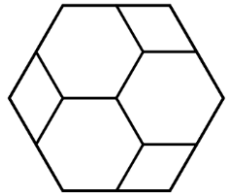
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
3.a.	<p>Does NOT make a triangle.</p> <p><i>Possible explanation:</i></p> <ul style="list-style-type: none"> The two shorter sticks have a total less than the longest stick $5 + 3$ is less than 10 The two shorter sticks won't close because the longest stick is longer than the sum of their lengths. 	<p>1 mrk: correct</p> <p>1 mrk: valid explanation</p>	SS	13.43	A	(2)
3.b	<p>Does make a triangle.</p> <p><i>Possible explanation:</i></p> <ul style="list-style-type: none"> The two shorter sticks have a total greater than the longest stick $6 + 9$ is greater than 12 The two shorter sticks will close because the longest stick is shorter than the sum of their lengths. 	<p>1 mrk: correct</p> <p>1 mrk: valid explanation</p>	SS	13.43	A	(2)

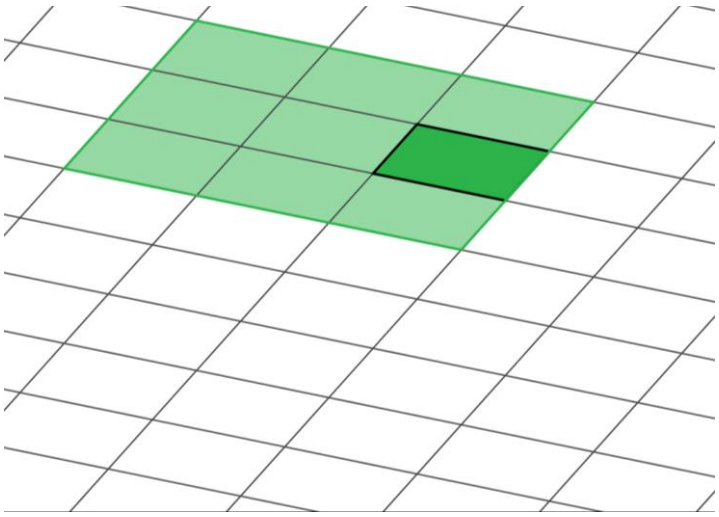
To prepare for this assessment, learners should have completed NumberSense Workbook 13, pages 44 – 45, Workbook 14, pages 63-64, Workbook 15, pages 48-50 and Workbook 16, pages 40-46.

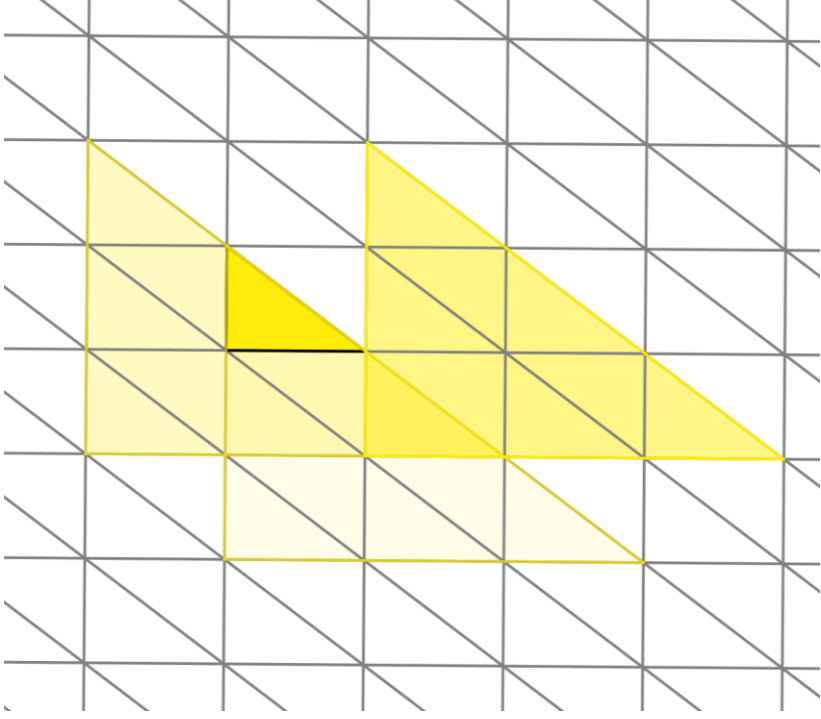
Give Page 5 to the learners the day before they do the investigation. They should cut out the shapes before and bring them with to class, ready to start the investigation. The bottom three shapes should be stuck on card and cut out. These will be used as tiles for tessellating.

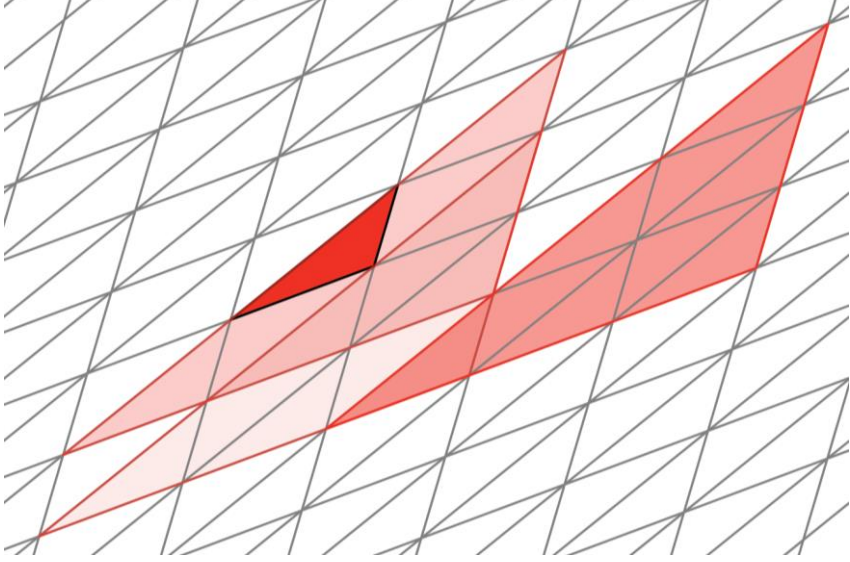
Memo:

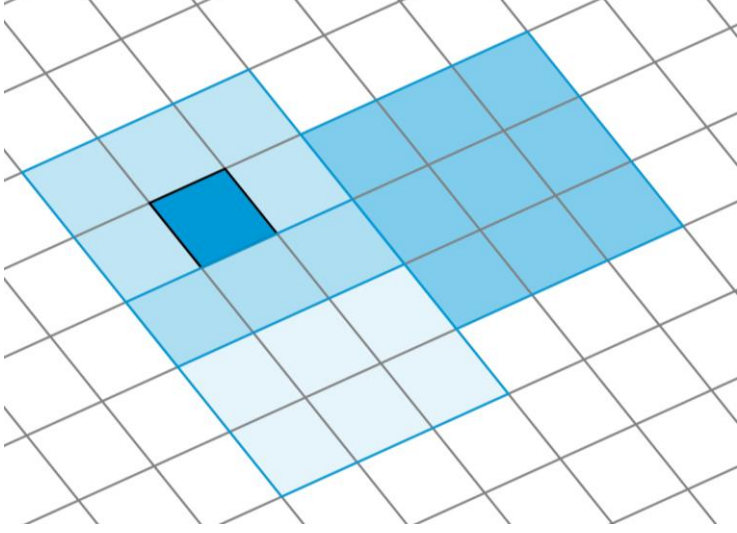
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.a.		2 mrks: 4 tiles fit outline accurately OR 1 mrk: At least 3 tiles fit outline accurately	SS		K	(2)
1.b.		2 mrks: 4 tiles fit outline accurately OR 1 mrk: At least 3 tiles fit outline accurately	SS		K	(2)
1.c.		2 mrks: 4 tiles fit outline accurately OR 1 mrk: At least 3 tiles fit outline accurately	SS		K	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.d.		2 mrks: 4 tiles fit outline accurately OR 1 mrk: At least 3 tiles fit outline accurately	SS		A	(2)
1.e.		2 mrks: 4 tiles fit outline accurately OR 1 mrk: At least 3 tiles fit outline accurately	SS		R	(2)
2.a	Yes. Each side of enlarged quadrilateral is made up of two sides of the original quadrilateral.	1 mrk: Correct with valid explanation.	SS		A	(1)
2.b.	Yes. Four of the original quadrilateral fit into the enlarged quadrilateral exactly.	1 mrk: Correct with valid explanation.	SS		A	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
3.a.	<p><i>One possible illustration of a similar quadrilateral with sides 3 times the length of original:</i></p> 	1 mark: Correct enlargement	SS/M		A	(1)
3.b.	9	1 mrk: correct	M		A	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
4.a.		<p>For each tessellation:</p> <p>1 mrk: 1 page with shape tessellated (no gaps or overlapping)</p> <p>And</p> <p>2 mrks: 2 or more similar shapes marked with sides 3x length of original OR</p> <p>1 mrk: Only 1 similar shape marked with sides 3x original</p>				(9)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
						

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
						
4.b.	<p>In every enlargement where the length of the sides are 3 times the original, the area of the enlarged shape is 9 times the area of the original shape. This can be seen because every enlargement is made up of 9 of the original shapes being tessellated.</p>	<p>2 marks: Correct conclusion with explanation or 1 mrk: correct conclusion</p>	M		R	(2)

To prepare for this assessment, learners should revise from NumberSense Workbook 13, pages 1 – 30; pages 40 – 45 (Triangles and symmetry) and pages 46 – 51 (Time).



Assessment framework:

Assessment framework:		Cognitive domain						
		Knowing (K)		Applying (A)		Reasoning (R)		TOTAL
Content area	Number, operations and relationships (NOR)	1a(1); 2a(1); 2b(1); 2e(1); 2f(1); 4a(2); 4b(1)	8	1b(1); 2c(1); 2d(1); 3a(2); 3b(2)	7	5(2); 6(2)	4	19
	Patterns, functions & algebra (PFA)	7a(1); 7b(1)	2					2
	Space & shape (SS)	11b(1)	1	11a(1); 11c(2);	3		-	4
	Measurement (M)	9(1)	1	10a(1); 10b(1)	2	11(2)	2	5
	Data handling (DH)							
	TOTAL	12		12		6		30

Memo:

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.a.	750	1 mrk: correct	NOR	13.1; 13.17; 13.21	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.b.	$6\frac{2}{3}$	1 mrk: correct	NOR	13.25; 13.29	A	(1)
2.a	92	1 mrk: correct	NOR	13.13	K	(1)
2.b	6 000	1 mrk: correct	NOR	13.8	K	(1)
2.c.	151	1 mrk: correct	NOR	13.3	A	(1)
2.d	$1\frac{1}{2}$ or 1 and 1-half	1 mrk: correct	NOR	13.21	A	(1)
2.e.	700	1 mrk: correct	NOR	13.5	K	(1)
2.f.	42	1 mrk: correct	NOR	13.27; 13.32	K	(1)
3.a.	483 <i>Possible working:</i> <ul style="list-style-type: none"> • $427 + 50 \rightarrow 477 + 6 \rightarrow 483$ (Breaking up) • $427 + 3 \rightarrow 430 + 53 \rightarrow 483$ (Completing the 10) 	2 mrks: correct or 1 mrk: correct working	NOR	13.18; 13.28; 13.30	A	(2)
3.b.	500 <i>Possible working:</i> <ul style="list-style-type: none"> • $145 + 55 = 200$; $70 + 230 = 300$ and $200 + 300 = 500$ (Pairing) 	2 mrks: correct or 1 mrk: correct working	NOR	13.22	A	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
4.a.	<p><i>Possible picture:</i></p>  <p>2 + 2 + 2 + 2 + 2 = 10</p>	<p>1 mrk: evidence of 5 friends with 2 choc each (drawing or number)</p> <p>1 mrk: evidence of 1 left over choc roughly cut into 5 pieces</p>	NOR	13.4; 13.6; 13.11; 13.14	K	(2)
4.b.	2 and 1-fifth or $2\frac{1}{5}$	1 mrk: correct	NOR	13.14	K	(1)
5.	<p>15 pencil bags</p> <p><i>Possible working:</i></p> $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = 1, \text{ because 5-fifths} = 1$ <p>3 metres \times 5 = 15</p>	<p>2 mrks: correct</p> <p>or</p> <p>1 mrk: correct working</p>	NOR	13.23	R	(2)
6.	<p>722</p> <p><i>Possible thinking:</i></p> <p>Since the right hand side of the equations are the same and 24 is half of 48, the missing number will be double 361.</p> <p>Double 300 = 600 and double 61 = 122, so $600 + 122 = 722$</p>	<p>1 mrk: correct</p> <p>1 mrk: any evidence of doubling 361</p>	NOR	13.2; 13.9; 13.31	R	(2)
7.a.		1 mrk: correct	PFA	13.16; 13.20;	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation														
7.b.	<table border="1"> <tr> <td>Picture number</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr> <tr> <td>Number of dots</td><td>5</td><td>7</td><td>9</td><td>11</td><td>13</td><td>15</td></tr> </table>	Picture number	1	2	3	4	5	6	Number of dots	5	7	9	11	13	15	1 mrk: 13 AND 15 correct	PFA	13.26; 13.31; 13.36	K	(1)
Picture number	1	2	3	4	5	6														
Number of dots	5	7	9	11	13	15														
8.a.	B only	1 mrk: correct	SS	13.40; 13.41	A	(1)														
8.b.	No lines of symmetry	1 mrk: correct	SS	13.42	K	(1)														
8.c	The sum of the two shorter sides (3 cm + 2 cm = 5 cm) is shorter than the length of the longest side (6 cm) so the sides won't close.	1 mrk: evidence of sum of shorter sides 1 mrk: evidence that the 2 shorter sides are less than longest side <i>This may be illustrated as a sketch.</i>	SS	13.43	A	(2)														
9.	25 minutes to 8 (also accept 7:35)	1 mrk: correct <i>If students included am or pm is irrelevant.</i>	M	13.46	K	(1)														
10.a.	06:40	1 mrk: correct	M	13.47; 13.48; 13.49	A	(1)														
10.b.	21:10	1 mrk: correct	M		A	(1)														

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
11.	09:45 <i>Possible thinking:</i> <ul style="list-style-type: none"> • $5\text{hrs} \times 3\text{min/hr} = 15\text{ min}; 10:00 - 15\text{ min}$ 	2 mrks: correct or 1 mrk: correct working	M	13.50	R	(2)

To prepare for this assessment, learners should revise from NumberSense Workbook 13, pages 31 – 39 and pages 46 – 51 (Data Handling) as well as Workbook 14, pages 1 – 28 and pages 38 – 46 (3D Space & Shape).


Assessment framework:		Cognitive domain						
		Knowing (K)		Applying (A)		Reasoning (R)		TOTAL
Content area	Number, operations and relationships (NOR)	1(1); 2a(1); 2b(1); 2c(1); 2d(1), 2e(1), 2f(1), 6(1)	8	2g(1), 3(2), 4(4), 5(1)	8	7(2), 8(2)	4	20
	Patterns, functions & algebra (PFA)	9a(1), 9b(1)	2	9c(2)	2			4
	Space & shape (SS)	10a(1), 11a(1)	2	10b(1), 10c(2)	3	11b(1)	1	6
	Measurement (M)							
	Data handling (DH)	12a(1); 13a(1)	2	12b(1); 13b(1)	2	13c(1)	1	5
	TOTAL	14		15		6		35

Memo:

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.	$5\frac{3}{4}$	1 mrk: correct	NOR	13.25; 13.29; 14.15	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
2.a	280	1 mrk: correct	NOR	13.10; 13.15; 13.24; 13.33; 14.2	K	(1)
2.b	$\frac{4}{8}$ (or 4 eighths)	1 mrk: correct <i>Accept all equivalent forms, e.g. $\frac{1}{2}$ as correct</i>	NOR	13.23; 13.25; 14.13; 14.16; 14.19; 14.25	K	(1)
2.c.	$\frac{3}{5}$ (or 3 fifths)	1 mrk: correct	NOR	14.15; 14.16; 14.19	K	(1)
2.d	8	1 mrk: correct	NOR	14.5; 14.14	K	(1)
2.e.	50	1 mrk: correct	NOR	14.8; 14.17	K	(1)
2.f.	30	1 mrk: correct	NOR	13.39; 14.24	K	(1)
2.g	$\frac{4}{3}$ or 4-thirds or $1\frac{1}{3}$ or 1 and 1-third	1 mrk: correct	NOR	13.34; 14.13; 14.15	A	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
3.	225 <i>Possible working:</i> <ul style="list-style-type: none"> $360 - 100 \rightarrow 260 - 30 \rightarrow 230 - 5 \rightarrow 225$ $135 + 5 \rightarrow 140 + 60 \rightarrow 200 + 100 \rightarrow 300 + 60 \rightarrow 360$ and $5 + 60 + 100 + 60 = 225$ 	2 mrks: correct or 1 mrk: correct working	NOR	14.14; 14.26	A	(2)
4.a.	240	1 mrk: correct <i>This could be done mentally as: half of 480</i>	NOR	13.4; 13.14; 13.38	A	(1)
4.b.	1 440	1 mrk: correct <i>This could be done mentally as: $50 \times 3 - 6$</i>	NOR	13.4; 13.14; 13.38	A	(1)
4.c.	1 680 <i>Possible working:</i> $35 = 30 + 5$; so $240 + 1\,440 = 1\,680$	2 mrks: correct or 1 mrk: correct working <i>Carry accuracy from part a. and b.</i>	NOR	13.4; 13.14; 13.38	A	(2)
5.	0,3	1 mrk: correct	NOR	14.24, 14.29	A	(1)
6.	1 000	1 mrk: correct	NOR	14.4	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation														
7.	32 marbles <i>Possible working:</i> $96 \div 3 = 32$	2 mrks: correct or 1 mrk: correct working	NOR	14.13	R	(2)														
8.	6 matches <i>Possible working:</i> Make a list, e.g. AB; AC; AD; BC; BD; CD	2 mrks: correct or 1 mrk: correct working	NOR		R	(2)														
9.a.		1 mrk: correct	PFA	14.3; 14.6; 14.28	K	(1)														
9.b.	<table border="1"><tr><td>Picture number</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>8</td></tr><tr><td>Number of matches</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>18</td></tr></table>	Picture number	1		2	3	4	5	8	Number of matches	4	6	8	10	12	18	1 mrk: 12 AND 18 correct	PFA	K	(1)
Picture number	1	2	3		4	5	8													
Number of matches	4	6	8	10	12	18														
9.c.	42 matches <i>Possible thinking:</i> <ul style="list-style-type: none">$12 + 15 \times 2 = 42$$20 \times 2 + 2 = 42$	1 mrk: correct 1 mrk: valid thinking	PFA	A	(2)															
10.a	pyramid	1 mrk: correct	SS	14.38; 14.41; 14.43	K	(1)														

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
10.b.	8	1 mrk: correct	M	14.39; 14.40	A	(1)
10.c.	A, C and D	2 mrks: all 3 correct and no extra or 1 mrk: all 3 correct and 1 extra or 2 correct and no extra	M	14.45	A	(2)
11.a.	cube	1 mrk: correct <i>Also accept rectangular-based prism</i>	SS	14.37; 14.38; 14.39	K	(1)
11.b.	3	1 mrk: correct <i>Only opposite faces could be the same colour</i>	SS		R	(1)
12.a.	9	1 mrk: correct	DH		K	(1)
12.b.	135	1 mrk: correct	DH		A	(1)
13.a.	Nike	1 mrk: correct	DH	13.62; 13.64	K	(1)
13.b.	18	1 mrk: correct	DH		A	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
13.c.	B	1 mrk: correct <i>B and C are both good options. The difference can be seen in "Other" where graph B is less than half Mizuno, but graph C is exactly half of Mizuno</i>	DH	13.56; 13.63	R	(1)

This examination covers all content from NumberSense Comprehensive Workbooks 13 and 14.

Assessment framework:		Cognitive domain						
		Knowing (K)		Applying (A)		Reasoning (R)		TOTAL
Content area	Number, operations and relationships (NOR)	1a(1), 2(1), 4a-g(7), 7(1), 8(2)	12	1b(1), 3(1), 5(4), 6(2)	8	9(3), (2)	5	25
	Patterns, functions & algebra (PFA)	11a(1), 11b(1)	2	11c(2)	2	11d(2)	2	6
	Space & shape (SS)	12(1), 13(1)	2	14(2), 15(2)	4	16(2)	2	8
	Measurement (M)	17(2), 18(2)	4	17(1), 19(2)	3	20(2)	2	9
	Data handling (DH)	21a(1)	1	21b(1)	1		·	2
	TOTAL	21		18		11		50

Memo:


Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
1.a.	$7\frac{3}{5}$	1 mrk: correct	NOR	13.25; 13.29; 14.15	K	(1)
1.b.	2 or 2,0	1 mrk: correct	NOR	14.25	A	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
2.	0,6	1 mrk: correct	NOR	14.24; 14.29	K	(1)
3.	$3\frac{3}{10}$	1 mrk: correct	NOR	14.29	A	(1)
4.a	70	1 mrk: correct	NOR	13.10; 13.15; 13.24; 13.33; 14.2	K	(1)
4.b	285	1 mrk: correct	NOR	13.13; 13.18; 13.28; 13.30; 13.35	K	(1)
4.c.	$\frac{3}{5}$ or 3-fifths	1 mrk: correct <i>Accept all equivalent forms, e.g. $\frac{6}{10}$ as correct</i>	NOR	13.21; 13.23; 13.25; 13.29; 14.13; 14.16	K	(1)
4.d	1499	1 mrk: correct	NOR	13.7; 13.21; 13.38	K	(1)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
4.e.	$\frac{3}{4}$ or 3-fourths or 3-quarters	1 mrk: correct <i>Accept all equivalent forms, e.g. 0,75 as correct</i>	NOR	13.21; 13.23; 13.25; 13.29; 14.13; 14.16	K	(1)
4.f.	566	1 mrk: correct <i>Can be done mentally as: 400 + 166</i>	NOR	13.3; 13.5; 13.24; 14.2	K	(1)
4.g.	48	1 mrk: correct	NOR	13.20; 13.26; 13.27; 13.34; 14.24	K	(1)
5.a.	600 <i>Possible working:</i> <ul style="list-style-type: none"> 155 + 245 = 400 and 180 + 20 = 200, so 400 + 200 = 600 	2 mrks: correct or 1 mrk: correct working	NOR	13.22	A	(2)

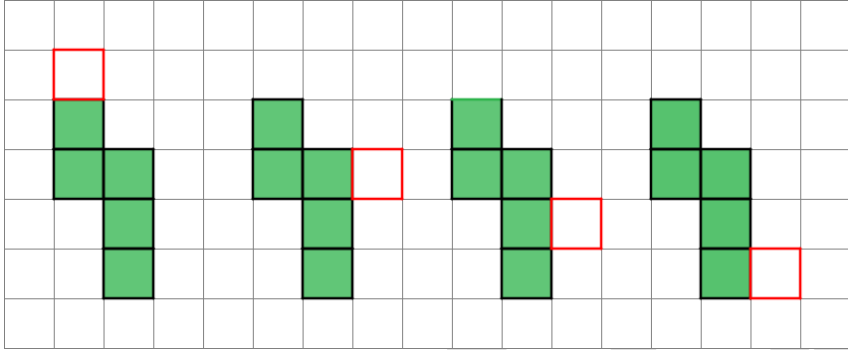
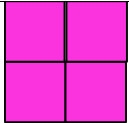
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
5.b	127 <i>Possible working:</i> <ul style="list-style-type: none"> $88 + 12 \rightarrow 100 + 115 \rightarrow 215; 12 + 115 = 127$ $215 - 15 \rightarrow 200 - 100 \rightarrow 100 - 12 \rightarrow 88; 15 + 100 + 12 = 127$ $88 = 15 + 63. 215 - 15 \rightarrow 200 - 63 \rightarrow 127$ $215 - 88 = 217 - 90 = 127$ 	2 mrks: correct or 1 mrk: correct working	NOR	14.5; 14.8; 14.12; 14.14; 14.20; 14.26; 14.30; 14.32; 14.35	A	(2)
6.	675 <i>Possible working:</i> <ul style="list-style-type: none"> $45 \times 10 = 450$ $45 \times 5 = \text{Half of } 450$ $= 225$ $450 + 225 = 675$ $50 \times 15 - 5 \times 15 = \text{half } 1500 - \text{half } 150$ $= 750 - 75$ $= 675$ 	2 mrks: correct or 1 mrk: correct working	NOR	14.31	A	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
7.	4	1 mrk: correct	NOR	14.11; 14.18; 14.22; 14.25; 14.27; 14.29	K	(1)
8.	Luthando The slice is bigger when the pizza is cut into fewer pieces.	1 mrk: Luthando 1 mrk: appropriate reason	NOR	13.6; 13.11; 13.34	K	(2)
9.a.	7 <i>Possible working:</i> <ul style="list-style-type: none"> $\frac{2}{5} + \frac{2}{5} \rightarrow \frac{4}{5} + \frac{2}{5} \rightarrow 1\frac{1}{5} + \frac{2}{5} \rightarrow 1\frac{3}{5} + \frac{2}{5} \rightarrow 2 + \frac{2}{5} \rightarrow 2\frac{2}{5} + \frac{2}{5} \rightarrow 2\frac{4}{5}$ <i>There are 5-fifths in 1 bag. $3 \times 5\text{-fifths} = 15\text{-fifths}$ in 3 bags. $15\text{-fifths} \div 2\text{-fifths} = 7$ remainder 1-fifth</i> 	2 mrks: correct or 1 mrk: correct working	NOR	13.21; 13.23; 14.1; 14.7; 14.13; 14.19; 14.25	R	(2)
9.b.	$\frac{1}{5}$ or 1-fifth	1 mrk: correct <i>Carry accuracy from ques. 9a, i.e. $3 - \frac{2}{5} \times$ "9a"</i>	NOR	13.34	R	(1)

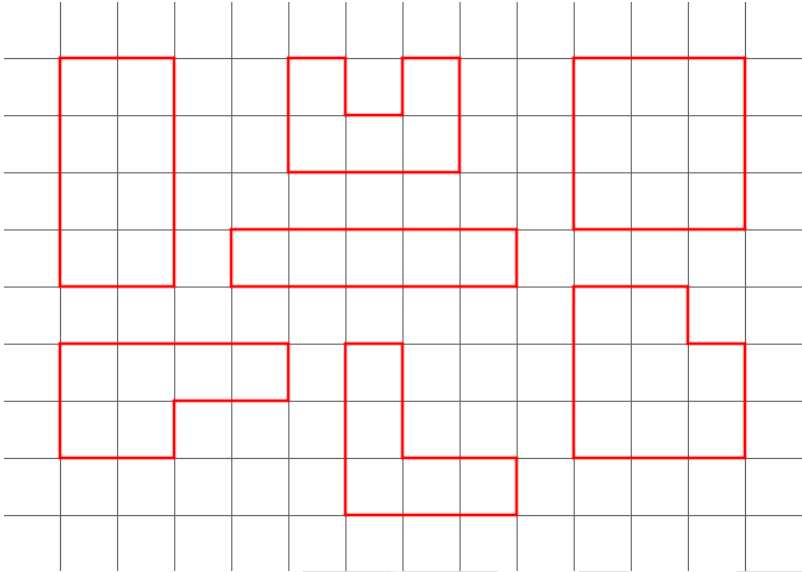
Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation														
10.	80 <i>Possible working:</i> <ul style="list-style-type: none">A list or number line with numbers increasing from 64 and decreasing from 96 in equal intervals$64 + 96 \rightarrow 160 \div 2 \rightarrow 80$	2 mrks: correct or 1 mrk: correct working	NOR		R	(2)														
11.a)		1 mrk: correct	PFA	13.16; 13.20; 13.26; 13.31; 13.36; 14.3; 14.6	K	(1)														
11.b)	<table border="1"><tr><td>Picture number</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>8</td></tr><tr><td>Number of dots</td><td>3</td><td>5</td><td>7</td><td>9</td><td>11</td><td>17</td></tr></table>	Picture number	1		2	3	4	5	8	Number of dots	3	5	7	9	11	17	1 mrk: 11 AND 17 correct	PFA	K	(1)
Picture number	1	2	3		4	5	8													
Number of dots	3	5	7	9	11	17														
11.c)	25 dots <i>Possible reasoning:</i> <ul style="list-style-type: none">$17 + 2 \rightarrow 19 + 2 \rightarrow 21 + 2 \rightarrow 23 + 2 \rightarrow 25$$17 + 2 \times 4 = 25$$12 \times 2 + 1 = 25$	1 mrk: correct 1 mrk: valid thinking	PFA	A	(2)															

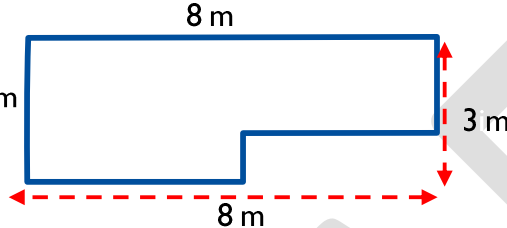
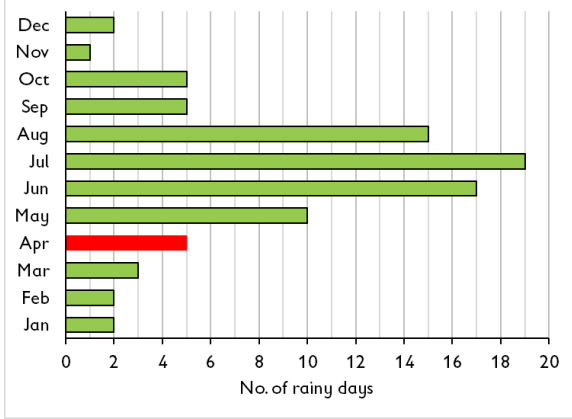
Ques	Correct solution(s)			Comment	Content area	Page ref.	Cognitive domain	Mark allocation												
11.d)	Picture 18 <i>Possible reasoning:</i> <ul style="list-style-type: none">$25 + 2(P13) \rightarrow 27 + 2(P14) \rightarrow 29 + 2(P15) \rightarrow 31 + 2(P16) \rightarrow 33 + 2(P17) \rightarrow 35 + 2(P18) \rightarrow 37$$37 - 1 \rightarrow 36 \div 2 \rightarrow 18$			1 mrk: correct 1 mrk: valid thinking	PFA		R	(2)												
12.	A and D			1 mrk: BOTH correct and no others	SS	13.40; 13.41	K	(1)												
13.	B			1 mrk: correct	SS	13.42	K	(1)												
14.	2 hexagons and 6 rectangles			1 mrk: 2 hexagons 1 mrk: 6 rectangles	SS	14.39; 14.40; 14.41; 14.42; 14.43	A	(2)												
15.	<table><tr><td></td><td>Side view</td><td>Top view</td></tr><tr><td>A bottle</td><td>E</td><td>A</td></tr><tr><td>Cup and saucer</td><td>F</td><td>D</td></tr><tr><td>Container</td><td>B</td><td>C</td></tr></table>				Side view	Top view	A bottle	E	A	Cup and saucer	F	D	Container	B	C	2 mrks: All correct 1 mrk: 3 or 4 correct	SS	13.50; 13.51; 13.52	A	(2)
	Side view	Top view																		
A bottle	E	A																		
Cup and saucer	F	D																		
Container	B	C																		

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
16.		<p>2 mrks: all 4 correct options provided OR</p> <p>1 mrk: 3 correct options and 1 incorrect option or 2 correct options and no other incorrect options (blank)</p>	SS	14.44	R	(2)
14.b	1 square and 4 triangles	<p>1 mrk: 1 square</p> <p>1 mrk: 4 triangles</p> <p><i>Students are not expected to specify the type of triangles</i></p>	M	14.43	K	(2)
14.c.	8	1 mrk: correct	M	14.39; 14.40	A	(1)
14.d.	A, C and D	<p>2 mrks: all 3 correct and no extra</p> <p>or</p> <p>1 mrk: all 3 correct and 1 extra or 2 correct and no extra</p>	M	14.45	A	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
15.a.	cube	1 mrk: correct	SS	14.37; 14.38; 14.39	K	(1)
15.b.		2 mrks: all 4 correct options provided OR 1 mrk: 3 correct options and 1 incorrect option or 2 correct options and no other incorrect options (blank)	SS	14.44	R	(2)
15.c.	3	1 mrk: correct <i>Only opposite faces could be the same colour</i>	SS		R	(1)
16.		1 mrk: blocks are square shaped 1 mark: correct arrangement	SS	14.53; 14.54; 14.55	A	(2)

Ques	Correct solution(s)			Comment	Content area	Page ref.	Cognitive domain	Mark allocation
17.	We say	Analogue time	24-hour time	1 mrk: 5:20 pm correct	M	13.46; 13.47; 13.49; 13.50	K & A	(3)
	20 past 5 in the evening	5:20 pm	17:20	1 mrk: 5 to 8 in the morning correct				
	5 (minutes) to 8 in the morning	7:55 am	07:55	1 mrk: 17:20 correct				
18.	8 cm + 2 mm			1 mrk: 8 cm 1 mrk: 2 mm (Allow 2 mm difference) Please check student copies as printer settings may change the size slightly.	M	14.61	K	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation
19.	<p>Some correct examples out of many possibilities:</p> 	<p>2 mrks: correct</p> <p><i>What is crucial is that students have kept the edges of their shapes on the grid and not used diagonals.</i></p>	M	14.63; 14.64	A	(2)

Ques	Correct solution(s)	Comment	Content area	Page ref.	Cognitive domain	Mark allocation																										
20.	<p>22 m</p> <p>Possible thinking:</p> <ul style="list-style-type: none">• $3 + 8 + 3 + 8$ 3 m  <ul style="list-style-type: none">• Even though we haven't been given the lengths of all the sides, the horizontal sides will total 8 m and the vertical sides will total 3 m.	<p>1 mrk: correct</p> <p>1 mrk: valid thinking</p>	M	14.63; 14.64	R	(2)																										
21.a.	 <table><caption>No. of rainy days per month</caption><thead><tr><th>Month</th><th>No. of rainy days</th></tr></thead><tbody><tr><td>Dec</td><td>2</td></tr><tr><td>Nov</td><td>1</td></tr><tr><td>Oct</td><td>5</td></tr><tr><td>Sep</td><td>5</td></tr><tr><td>Aug</td><td>15</td></tr><tr><td>Jul</td><td>19</td></tr><tr><td>Jun</td><td>17</td></tr><tr><td>May</td><td>10</td></tr><tr><td>Apr</td><td>5</td></tr><tr><td>Mar</td><td>3</td></tr><tr><td>Feb</td><td>2</td></tr><tr><td>Jan</td><td>2</td></tr></tbody></table>	Month	No. of rainy days	Dec	2	Nov	1	Oct	5	Sep	5	Aug	15	Jul	19	Jun	17	May	10	Apr	5	Mar	3	Feb	2	Jan	2	<p>1 mrk: correct</p>	DH	13.57; 13.63	K	(1)
Month	No. of rainy days																															
Dec	2																															
Nov	1																															
Oct	5																															
Sep	5																															
Aug	15																															
Jul	19																															
Jun	17																															
May	10																															
Apr	5																															
Mar	3																															
Feb	2																															
Jan	2																															
21.b.	Graph A	<p>1 mrk: correct</p>	DH	13.56; 13.57	A	(1)																										