Understanding and Applying: Mathematical Reasoning, Verbal Reasoning and Language Inference

Sharan Spall

First published in Great Britain in 2020.

DEDICATION

To all the beautiful children who I have taught, near and far, including my own - Jeevan & Sienna.

"Reasoning and understanding exist not to make simple things complicated, but to make complicated things simple."

WHAT OTHERS SAY

"Sharan Spall has written an outstanding book that covers concepts and questions that are fundamental for students who are preparing for the 11+ exams. What makes this book unique is the fact that it focuses on applying inference and problem-solving skills - two areas that students tend to really struggle with. If you want your child to score top marks and become more familiar with 11+ exam-style questions, I'd wholeheartedly recommend 'Understanding and Applying Mathematical Reasoning, Verbal Reasoning and Language Inference.'"
Victoria Ademosu - Founder, TheTutoress.com.

"With several years' experience of preparing children for the 11+ exams under her belt, Sharan has identified topics which children often find challenging and, subsequently, struggle with. In this book, she provides targeted exercises for these topics along with answers, which will allow parents to support their children's learning at home. This book will equip children with invaluable competence and agility in these subject areas."
Nkem Ivara - English & Verbal Reasoning Tutor and Founder, Wordsmythe Tutoring.

CONTENTS

INTRODUCTION

Over decades of coaching and tutoring hundreds of primary level children, I've found that there are several key attributes that younger children have in spades: aspiration, self-awareness, curiosity, and vulnerability. They truly want to understand and master new skills; they see themselves very clearly; they constantly think of and ask good questions; and they tolerate their own mistakes as they move up the learning curve.

But, time and time again, I have seen children struggle to understand ***why*** they are doing something. We know that primary teaching should be about exploring, reasoning and challenging thinking, but all too often learning by rote is prioritized above reasoning.

The exercises in this book are designed to help children and parents to see beyond the letters and numbers, and to develop learning with critical thinking and reasoning skills. They emphasise the importance of deeper understanding over the recalling of facts and will help children to engage fully with and enjoy their learning journey.

In the following ten chapters, you will find the culmination of the key reasoning skills required for pupils sitting 11+ secondary selection tests. This includes students seeking entry to grammar schools and independent senior schools at 11+ and 13+.

Each chapter is presented in three sections:

Section A of each chapter gives your child a Mathematical Reasoning toolkit to help develop a well-rounded foundation for primary to secondary transition.

Section B of each chapter gives your child a range of Verbal Reasoning questions, which are common in 11+ entrance tests.

Section C of each chapter includes an extract from a well-known children's book. Read the extract with your child and attempt to answer the questions together to develop your Language Inference skills.
At the end of each chapter, I'll summarise what your child will have learnt and why the exercise is important in their learning journey. Remember to share this information with your child, so that they can chart their progression and understand how the exercises are helping their learning and development.

Check your child's answers with the answers at the back and give your child a score at the end of each chapter. Remember practice makes perfect!

Wishing your child every success,

Sharan

A GUIDE TO THE KEY TERMS IN THIS BOOK

Mathematical Reasoning

Reasoning in Mathematics is the process of applying logical and critical thinking to a problem in order to work out the correct strategy to use (and as importantly, not to use) in reaching a solution.

Fluency in Maths and memorising **key number facts** is essential in Key Stage 1 and Key Stage 2 Mathematics. However, **using and applying these facts** to a range of contexts, and different types of word problems, including the more complex multi-step and two-step word problems is the essence of Key Stage 2 to Key Stage 3 Mathematics. In this book, I will help you understand the importance of Mathematical Reasoning and how to apply reasoning to problems.

Verbal Reasoning

Verbal Reasoning is, by definition, *'understanding and reasoning using concepts framed in words – it aims at evaluating the ability to think constructively rather than just recognise vocabulary'*. Verbal Reasoning is a test of a skill rather than learnt knowledge.

In this book, you will learn how to use Verbal Reasoning to assess a child's critical thinking skills. It will help children to understand and articulate ***why*** they are doing things, improving their understanding and improving their engagement with learning materials.

Language Inference

You practise Language Inference every day. If a toddler tries a new food for the first time and he scrunches up his face, we can infer that the toddler did not like that food. In this book you will be able to practise Language Inference with your child, looking beyond what is stated in the text and finding the ideas to which the author only hints.

This will make your child a more active reader and critical thinker. However, it's important to understand the literal meaning of the text first, before you move on to exploring the inference. The exercises in this book will help you and your child to progress up this learning curve in the right way.

CHAPTER 1

CHAPTER 1, SECTION A – MATHEMATICAL REASONING

Directed Numbers

The following exercises will help you to practise using directed numbers to describe any quantity that can be measured above or below zero. Common examples of directed numbers include temperature and distance (above or below sea level).

A digit without a "+" or a "–" sign in front of it is positive (+). Example: 5°C means +5°C.

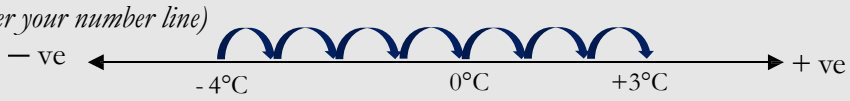
Examples:

1. At noon, the temperature was 25°C. At midnight it had fallen by 26°C.
   What is the temperature at midnight?

   Answer: +25 – 26 = **– 1**

2. In Toronto, the temperature is – 4°C and in London it is 3°C.
   Find the difference in temperature between Toronto and London.

   (Remember your number line)



   Answer: +3 – (- 4) = **7**

Questions

1. Which temperature is higher? Underline the correct answers. [5 marks]

   a. -2°C or 6°C

   b. 7°C or -11°C

   c. -5°C or -1°C

   d. 0°C or -2°C

   e. -15°C or -17°C

2. What is the difference in temperatures below? [5 marks]

   a. -6°C and 4°C Answer: _____

b. -11°C and -19°C Answer: _____

c. -7°C and -1.5 °C Answer: _____

d. -99°C and 99°C Answer: _____

e. 0°C and -17°C Answer: _____

3. A climber starts at 125m and descends 75m. How far above sea level does he get to? [1 mark]

Answer: _____

4. The temperature in a freezer is -3°C. The door has been accidentally left open and the temperature has risen by 5°C. What is the new temperature? [1 mark]

Answer: _____

5. Find the values below. [3 marks]

a. $7 + (-9) – (+2)$ Answer:_____

b. $-9 + (-5) – (-6)$ Answer:_____

c. $-10 \times (+3)$ Answer:_____

Total: / 15

CHAPTER 1, SECTION B – VERBAL REASONING

The next two exercises will help your child learn to think using **words, symbols** and **numbers**.

Questions

1. Insert a letter. Find the **one** letter that will complete the word in front of the brackets and begin the word after the brackets. **The same letter must fit into both sets of brackets.** Mark this letter in the space provided.

Example.	**BLAS (T) REASON**	**SHOR (T) RIP**
a.	SLU (__) ENTLE	BA (__) IRL
b.	BAL (__) INE	BOW (__) AKE
c.	TA (__) AN	DRO (__) INE
d.	BU (__) ES	GRE (__) ELLOW
e.	BEE (__) ICE	COR (__) EW
f.	LEA (__) IRE	SEL (__) AN
g.	STA (__) END	CRA (__) LOW
h.	SLO (__) ON	DRA (__) EST
i.	COP (__) AWN	TRA (__) OUR
j.	DOO (__) OSE	BEA (__) OOM
k.	GIR (__) OVE	CRAW (__) OSE
l.	CLU (__) AKE	CU (__) ROWN

Total: / 12

2. Number relationship. The numbers in each group are **related** in the same way. Find the missing number in the third group and write it in the space provided.

Example.	**(2 [12] 6)**	**(5 [20] 4)**	**(3 [27] 9)**
a.	(10 [23] 3)	(5 [16] 6)	(2 [__] 5)
b.	(4 [12] 2)	(10 [32] 6)	(16 [__] 5)
c.	(6 [46] 20)	(2 [32] 15)	(7 [__] 10)
d.	(12 [16] 8)	(6 [22] 20)	(15 [__] 13)
e.	(16 [40] 8)	(11 [27] 5)	(4 [__] 11)
f.	(10 [21] 5)	(4 [23] 13)	(21 [__] 9)
g.	(6 [10] 14)	(3 [19] 20)	(4 [__] 9)
h.	(4 [27] 6)	(5 [53] 10)	(8 [__] 2)
i.	(6 [7] 10)	(20 [25] 14)	(11 [__] 8)
j.	(4 [8] 6)	(11 [33] 9)	(6 [__] 12)
k.	(2 [16] 6)	(7 [23] 10)	(2 [__] 4)
l.	(4 [9] 5)	(6 [9] 3)	(7 [__] 4)

Total: / 12

CHAPTER 1, SECTION C – LANGUAGE INFERENCE

The following extract is taken from the novel, Tom Sawyer, by Mark Twain. By applying language inference to this extract, you will able to better understand the context and meaning of the text.

"TOM!"
No answer.
"TOM!"
No answer.
"What's gone with that boy, I wonder? You TOM!"
No answer.

The old lady pulled her spectacles down and looked over them about the room; then she put them up and looked out under them. She seldom or never looked through them for so small a thing as a boy; they were her state pair, the pride of her heart, and were built for "style", not service - she could have seen through a pair of stove-lids just as well. She looked perplexed for a moment, and then said, not fiercely, but still loud enough for the furniture to hear:

"Well, I lay if I get hold of you, I'll…"

She did not finish, for by this time she was bending down and punching under the bed with the broom, and so she needed breath to punctuate the punches with. She resurrected nothing but the cat.

"I never did see the beat of that boy!"

She went to the open door and stood in it and looked out among the tomato vines and "jimpson" weeds that constituted the garden. No Tom. She lifted her voice at an angle calculated for distance and shouted:

"Y-o-u-u Tom!"

There was a slight noise behind her, and she turned just in time to seize a small boy by the slack of his dungarees and arrest his flight.

"There! I might 'a' thought of that closet. What you been doing in there?"
"Nothing."
"Nothing! Look at your hands. And look at your mouth. What is that truck?"
"I don't know, aunt."
"Well, I know. It is jam! – that's what it is. Forty times I've said if you didn't let that jam alone, I'd skin you. Hand me that switch."

The switch hovered in the air - the peril was desperate – "My! Look behind you, aunt!"

The old lady whirled round and snatched her skirts out of danger. The lad fled on the instant, scrambled up the high board-fence, and disappeared over it. His aunt Polly stood surprised a moment, and then broke into a gentle laugh.

"Hang the boy, can't I never learn anything? Ain't he played me tricks enough like that for me to be looking out for him by this time? But old fools is the biggest fools there is. Can't teach an old dog new tricks, as the saying is.

Questions

Answer in full sentences and in your own words as far as possible:

1. Why is the word 'TOM!' written in capital letters in the first line? [1 mark]

Answer:_____

2. What does the expression "The pride of her heart" mean? [1 mark]

Answer:_____

3. "The old lady's spectacles were built for "style", not service." What does this mean? [2 marks]

Answer:_____

_____

4. Why does the old lady punch under the bed with the broom? [1 mark]

Answer:_____

5. How do we know that the old lady is unsuccessful when she punches under the bed with a broom? [1 mark]

Answer:_____

6. What does "resurrected" mean? [1 mark]

Answer:_____

7. Where had the boy been hiding? [1 mark]

Answer:_____

8. Why had the boy been hiding? [1 mark]

Answer:_____

9. What do you think a "switch" is? [1 mark]

Answer:_____

10. Explain what the phrase "the peril was desperate" means. [1 mark]

Answer:_____

11. How does the boy escape from his aunt? [1 mark]

Answer:_____

12. How does the boy's aunt react when he escapes? [1 mark]

Answer:_____

13. How do we know that the boy has done this sort of thing before? [1 mark]

Answer:_____

14. "Can't teach an old dog new tricks.." What does this saying mean? [1 mark]

Answer:_____

15. The aunt uses interesting expressions in her speech. Rewrite these sayings in correct English. [3 marks]

a. "I never did see the beat of that boy!"

Answer:_____

b. "What *is* that truck?"

Answer:_____

c. "Forty times I've said if you didn't let that jam alone I'd skin you."

Answer:_____

16. "Y-o-u-u Tom!" What does the punctuation in this sentence tell us about the way the old lady says this? [1 mark]

Answer:_____

Total: / 19

My Chapter 1 Score: / 58 = _____ %

Well done! In chapter one you have learnt that directed numbers are either positive or negative. By completing the exercises in chapter one, you have begun to apply reasoning skills and inference to your Maths and English work. You will now start to understand the 'why' of Mathematical problems, applying logical and critical thinking to the work you're doing. And, by applying language inference to literary excerpts, you will be able to better understand the context and meaning of the text.

CHAPTER 2

CHAPTER 2, SECTION A – MATHEMATICAL REASONING

Highest Common Factor

In this exercise you will learn how to use **prime numbers** and **prime factors**, as well as applying prime factorisation to problems.

Prime Number

A Prime Number is a whole number that cannot be made by multiplying two whole numbers. If we can make it by multiplying two whole numbers, it is a Composite Number. 1 is not prime and not composite.

Prime Factor

A Prime Factor is a factor that is a prime number. In other words: If any prime numbers can be multiplied to give the original number then we say that this number is a prime factor. Example: The prime factors of 15 are 3 and 5 (because $3 \times 5 = 15$, and 3 and 5 are prime numbers).

Prime Factorisation

Prime factorisation is finding which prime numbers multiply together to make the original number.

Highest Common Factor

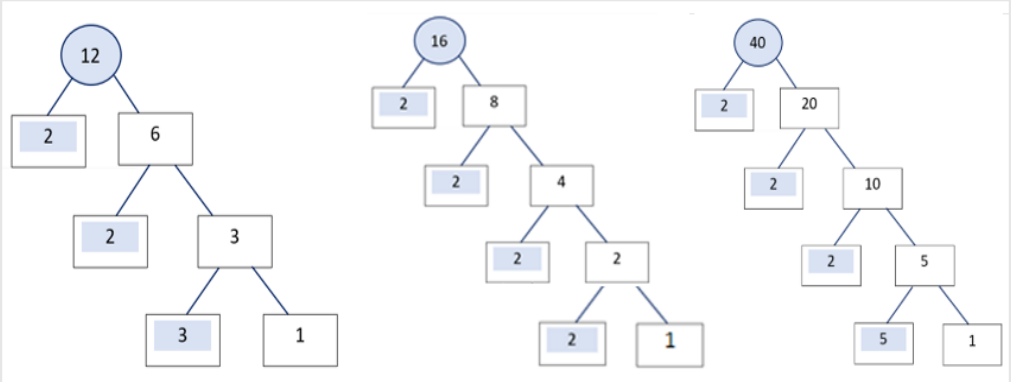
A Factor is a number that divides into another number exactly (i.e. no remainder). Example: 6 is a factor of 36, but 6 is NOT a factor of 37.

When looking at 2 or more numbers, they may all have a common factor, but the Highest Common Factor (HCF) is the largest of these common factors.

Example:

Find the HCF of 12, 16 and 40

First express each number using Prime Factors.



12 = **2 X 2** X 3 16 = **2 X 2** X 2 X 2 40 = **2 X 2** X 2 X 5

So, the HCF for all 3 numbers is 2 x 2 = 4 = $\underline{\mathbf{2^2}}$

Questions

1. In the list of numbers below, work out which ones have 6 as a factor. [1 mark]
   16 , 26 , 24 , 52 , 46 , 48 , 36 , 76

Answer: _____

2. List all the prime numbers between 50 and 70. [1 mark]

Answer: _____

3. Find the prime factors of 360. [2 marks]

Answer: _____

4. Find the prime factors of 1250. [2 marks]

Answer: _____

5. Find the Common Prime Factors of 15, 60 and 85. [5 marks]

Answer: _____

6. Find the HCF of the following using prime factors and powers. [1 mark]

$2 \times 2 \times 2 \times 5 \times 5$

$2 \times 2 \times 3 \times 7$

$2 \times 2 \times 2 \times 5 \times 11$

Answer: _____

7. Find the HCFs. [3 marks]

a. 48 , 80 and 112

Answer: _____

b. 90 , 198 and 234

Answer: _____

d. 324 , 432 and 560

Answer: _____

Total: / 15

CHAPTER 2, SECTION B – VERBAL REASONING

The next exercise will help you to spot words which do not belong in a list, and will interrogate your critical thinking as we ask you ***why*** the words you've chosen don't fit into the list. The second task will help you learn to think about **patterns** and **sequences** using the letters in the alphabet.

Questions

1. Find the odd words. Find the **two** words that are **different** from the other three and write them in the space provided. Give a brief reason for your answers.

Example.	**Monday Tuesday Friday month noon** **<u>month</u> and <u>noon</u>** **My reason why: *Monday*, *Tuesday* and *Friday* are days of the week, whereas *month* and *noon* are not.**
a.	cat horse duck chicken dog _____ and _____ My reason why:
b.	planet Venus Earth Mars space _____ and _____ My reason why:
c.	cooker boil roast eat fry _____ and _____ My reason why:
d.	swimming judo cricket rugby football _____ and _____ My reason why:
e.	lamb horse pig calf foal _____ and _____ My reason why:

f.	mother father daughter nephew sister _____ and _____ My reason why:
g.	unusual unwell untied ill sick _____ and _____ My reason why:
h.	knife plate cup spoon saucer _____ and _____ My reason why:
i.	carrot strawberry pear bean lettuce _____ and _____ My reason why:
j.	uncle actress boy girl master _____ and _____ My reason why:
k.	pair orange banana couple duo _____ and _____ My reason why:
l.	mower grass trimmer bush plant _____ and _____ My reason why:

Total: / 12

2. Alphabet series. Find the pair of letters that continue each **series** in the most sensible way. Write the answer in the space provided.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Example.	**AB, BC, CD, DE, EF,**	**(FG)**
a.	AJ, BI, CH, DG, EF,	( )
b.	NK, PM, RO, TQ, VS,	( )
c.	QR, PP, ON, NL, MJ,	( )
d.	CZ, BY, AX, ZW, YV,	( )
e.	KL, LM, MN, NO, OP,	( )
f.	RH, PJ, NL, LN, JP,	( )
g.	AB, EF, IJ, MN, QR,	( )
h.	US, VT, WU, XV, YW,	( )
i.	GB, FD, EF, DH, CJ,	( )
j.	RR, NP, JN, FL, BJ,	( )
k.	RG, SH, UJ, XM, BQ,	( )
l.	QM, OO, MQ, KS, IU,	( )

Total: / 12

CHAPTER 2, SECTION C – LANGUAGE INFERENCE

The following extract is taken from the novel, Eye of the Hurricane, by Lee Roddy. By applying language inference to this extract, you will better understand the context and meaning of the text.

MIGHTY gusts of wind continued to shake the swamp shack where another violent gust of wind tore at the loosened corner of the roof.

"There it goes!" Tank exclaimed as the corner started to sag under the weight of rain.

A piece of corrugated sheeting sailed away, and the corner collapsed inward, causing everyone to scramble up and back as far away as possible.

"We're dead!" Garcia screamed. "We're all dead!"

"No, we're not!" the pilot cried. "The weight of the water on the roof caused that corner to collapse, but it'll soon drain off. Besides, I think I hear the storm easing off. So if that end of the roof holds up a little while longer, we can start for the cave."

Everyone except Garcia fell silent. He sank back down against the wall, closed his eyes and mumbled over and over, "Oh, God! Oh, God!"

It took a moment for Josh to realise that the man was praying in the only way he knew how.

Josh joined the others in listening hopefully as the rain and wind slowly faded away. Falling rain from the collapsed end of the roof eased off too, but there was so much water on the floor that everyone's feet were wet.

Finally, Eddie stood up. "The eye of the hurricane is almost here," he announced. "We'll have about fifteen minutes to reach the cave before the back side of the storm starts..."

"I'm getting out of here now!" Frank interrupted, hoisting himself to his feet and pulling on his raincoat. "Come on, Garcia. If you want to live through this thing, you've got to help yourself."

"Wait!" the pilot cried, but the big poacher yanked the door open and plunged through it.

The wind and rain gushed into the tiny room, making it rock so hard Josh feared it would blow off the foundation. The force of the wind made him turn his head momentarily. When he looked again, Frank and Garcia were gone, leaving their backpacks behind.

Eddie said sadly, "They shouldn't have done that."

A few minutes later, Eddie decided it was safe to head for the cave. Everyone stood and stepped outside.

Now only light rain fell, unlike the blinding downpour of the past few hours. The incredible gusting winds had completely died down. Josh squinted at the sky. The dark clouds warned that this was only a momentary lull. Greater natural fury was coming.

"Fifteen minutes before the eye passes," Eddie warned. "We'd better be in the cave before then, or we may not be so lucky when the back side of the storm hits."

It was very hard going because the hillside was slick, and there were countless downed trees, uprooted shrubs and mud slides everywhere. Still, Josh was so glad to be out of the shack that he didn't really mind.

Maybe Dad and Dr Nakamura are in the cave, Josh thought, ignoring the mud that weighted down his shoes. He hurried through the hurricane's eye in renewed hope.

Questions

Answer full sentences and in your own words as far as possible:

1. What is a shack? [1 mark]

Answer:_____

2. "There it goes!" To what is Tank referring? [1 mark]

Answer:_____

3. Why was it important to change locations only during the eye of the hurricane? [1 mark]

Answer:_____

4. Find a word in the passage that tells us what Frank's occupation is. Explain what this means in your own words. [2 marks]

Answer:_____

5. What is a "momentary lull"? [1 mark]

Answer:_____

6. "Greater natural fury was coming." What does this mean? [2 marks]

Answer:_____

_____

7. In your own words, why did the group find it difficult to climb up the hillside? [3 marks]

Answer:_____

_____

_____

8. Why do you think Josh had "renewed hope"? [1 mark]

Answer:_____

9. Underline the correct answer. "The hillside was "slick"". What does this word mean? [1 mark]

   a. wet

   b. slippery

   c. unwell

   d. steep

10. Write the meaning of the following words as they are used in the passage. [4 marks]

   a. mumble_____

   b. downed_____

   c. foundation_____

   d. fury_____

11. For each of the following words, write down a word that is opposite in meaning. [4 marks]

a. mighty _____

b. continued _____

c. hopefully _____

d. gushed _____

Total: / 21

My Chapter 2 Score: / 60 = _____ %

Congratulations on completing chapter two. You're now developing your mathematical skills particularly by combining your knowledge of factors, multiples and prime numbers. You have been introduced to Prime Factorisation as a means of finding the Highest Common Factor. Lots of children confuse these terms but by completing these exercises you are beginning to strengthen your mathematical-muscle. Well done! You have also been introduced to grouping nouns to find the odd ones out – and by reading Eye of the Hurricane you have gone on to infer the meaning of the extract and explore the language that has been used.

CHAPTER 3

CHAPTER 3, SECTION A – MATHEMATICAL REASONING

Lowest Common Multiple

A **multiple** is a number which can be divided by another number without leaving a remainder.

Example: 15 is a multiple of 3, but 16 is not a multiple of 3.

Sometimes you will need to find the **Lowest Common Multiple (LCM)** to help solve a problem. The LCM of 2 or more numbers is the smallest number than can be divided by them without leaving a remainder. This exercise will help you to use the LCMs in Mathematical problems.

Examples:

1. Find the LCM of 12, 16 and 40.

   First express each number using **Prime Factors.**

   $12 = 2 \times 2 \times 3$
   $16 = 2 \times 2 \times 2 \times 2$
   $40 = 2 \times 2 \times 2 \times 5$

   The LCM of these numbers **must** have the factors listed above.
   Remember you only list them out once.
   Answer: $2 \times 2 \times 2 \times 2 \times 3 \times 5 =$ **240**

2. Find the LCM of 180 and 252 using prime factors and powers.

   $180 = 2 \times 2 \times 3 \times 3 \times 5$
   $252 = 2 \times 2 \times 3 \times 3 \times 7$

   The LCM of these numbers is $2 \times 2 \times 3 \times 3 \times 5 \times 7$
   Answer: $\mathbf{2^2 \times 3^2 \times 5 \times 7}$

Questions

1. Find the LCM of the following. [6 marks]

   a. 4 and 6

Answer:_____

b. 9 and 12

Answer:_____

c. 10, 16 and 18

Answer:_____

d. 24, 32 and 40

Answer:_____

e. 30, 45, 75 and 95

Answer:_____

f. 80, 70, 110 and 150

Answer:_____

2. A small amount of powder can be divided into equal heaps of 6g, 8g or 12g. Find the smallest amount of powder for which this would be possible. [1 mark]

Answer:_____

3. Find the smallest sum of money that is an EXACT multiple of 60p, 72p and £1.12. [1 mark]

Answer:_____

4. Find the smallest number of marbles that could be shared equally into bags of 15, 20 or 24 marbles. [1 mark]

Answer:_____

5. In a local church the bells are rung at regular intervals of 4s, 6s and 9s. If they begin ringing at the same time, how long will it be before they ring at the same time again? [1mark]

Answer:_____

Total: / 10

CHAPTER 3, SECTION B – VERBAL REASONING

By **decoding** these puzzles, you will be able to find meaning in seemingly random groups of letters.

Questions

1. The first code word in each question has been worked out for you. Work out the second word / code in the question in the same way and write it in the space provided.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Example.	**If the code for TRAP is USBQ What does DPME mean?**	**(<u>COLD</u>)**
a.	If the code for BALL is CBMM What does UPZT mean?	( )
b.	If GHOC means FIND What does MNTS mean?	( )
c.	If the code for JUMP is LWOR What is the code for SPIN?	( )
d.	If the code for DOWN is BMUL What does MTCP mean?	( )
e.	If IDCS means LEFT What is the code for HALF?	( )
f.	If the code for MISS is NLTV What is the code for ACHE?	( )
g.	If VTCA means TRAY What does IKXG mean?	( )
h.	If the code for FOWL is GQZP What is the code for SLIP?	( )
i.	If the code for NAIL is REMP What does XIWX mean?	( )

j.	IF GEEL means EACH What does PSPI mean?	( )
k.	If RRLL means STOP What is the code for GONE?	( )
l.	If the code for STAB is TSCZ What is the code for PLUS?	( )

Total: / 12

2. Find the two words, one from each group that will complete the sentence in the best way. Underline **BOTH** words below.

Example.	Time is to (first, **second**, third) as distance is to (gram, kilo, **metre**).
a.	Top is to (lid, bottom, win) as inside is to (outside, closed, trapped).
b.	Grass is to (long, green, tall) as corn is to (flour, flake, yellow).
c.	Cow is to (field, bull, herd) as sheep is to (flock, wool, lamb).
d.	Sum is to (add, some, total) as sun is to (moon, stars, son).
e.	Octagon is to (six, seven, eight) as pentagon is to (four, five, six).
f.	Cheap is to (bird, expect, expensive) as always is to (sometimes, often, never).
g.	Clean is to (wash, sparkle, dirty) as brush is to (dust, sweep, scrape).
h.	Divide is to (change, remainder, multiply) as add is to (subtract, equals, plus).

i.	Hand is to (mouth, arm, glove) as foot is to (toes, sock, ball).
j.	Sea is to (beach, see, shore) as tide is to (waves, tied, water).
k.	Banana is to (fruit, custard, curved) as onion is to (cry, ring, vegetable).
l.	Light is to (sun, bulb, heavy) as tight is to (mean, loose, close).

Total: / 12

CHAPTER 3, SECTION C – LANGUAGE INFERENCE

The following extract is taken from, Cider with Rosie, by Laurie Lee. It is about a little boy's first day at school. By applying language inference to this extract, you will be able to better understand the context and meaning of the text.

THE village school at that time provided all the instruction we were likely to ask for. It was a small stone barn divided by a wooden partition into two rooms - The Infants and The Big Ones. There was one dame teacher and perhaps a young girl assistant. Every child in the valley went there, remained till he was fourteen years old, then was presented to the working field or factory with nothing in his head but a few sayings, a jumbled list of wars, and a dreamy image of the world's geography. It seemed enough to get by with, in any case; and was one up on our poor old grandparents.

This school, when I came to it, was at its peak. It was packed to the walls with pupils. Wild boys and girls from miles around - from the outlying farms and half-hidden hovels way up at the ends of the valley - swept down each day to add to our numbers, bringing with them strange oaths and odours, quaint garments and curious pies. They were my first amazed vision of any world outside the womanly warmth of my family; I didn't expect to survive it for long, and I was confronted with it at the age of four.

The morning came, without any warning, when my sisters surrounded me, wrapped me in scarves, tied up my bootlaces, thrust a cap on my head and stuffed a baked potato in my pocket.

"What's this?" I asked.
"You're starting school today."
"I ain't. I'm stopping 'ome."
"Now, come on, Loll. You're a big boy now."
"I ain't."
"You are."
"Boo-hoo."

They picked me up bodily, kicking and bawling, and carried me up the road.

"Boys who don't go to school get put in boxes, and turn into rabbits, and get chopped up on Sundays."

I felt this was overdoing it rather, but I said no more after that. I arrived at the school just three feet tall and fatly wrapped in my scarves. The playground roared like a rodeo, and the potato burned through my thigh. Old boots, ragged stockings, torn trousers and skirts, went skidding and skating around me. The rabble closed in; I was encircled, grit flew in my face like shrapnel. Tall girls with frizzled hair, and huge boys with sharp elbows, began to prod me with hideous interest. They plucked at my scarves, spun me around like a top, twisted my nose, and stole my potato.

I was rescued at last by a gracious lady - the sixteen-year-old junior-teacher - who boxed a few ears and dried my face and led me off to The Infants. I spent that first day picking holes in paper, then went home in a smouldering temper.

"What's the matter, Loll? Didn't he like it at school, then?"
"They never gave me the present!"
"Present? What present?"
"They said they'd give me a present.
"Well, now, I'm sure they didn't."
"They did! They said: 'You're Laurie Lee, ain't you? Well, you just sit there for the present."
"I sat there all day but I never got it. I ain't going back there again!"

But after a week I felt like a veteran and grew as ruthless as anyone else. Somebody had stolen my baked potato, so I swiped somebody else's apple.

Questions

1. Underline the correct answer. The narrator says that his education was "one up on our poor old grandparents." This phrase means? [1 mark]

a. It was a better education than his grandparents had had.

b. It was a worse education than his grandparents had had.

c. His own grandparents had been too poor to go to school.

d. His grandparents went to school for a very long time.

2. In your own words, say what the four things were that the wild boys and girls brought to school with them. [4 marks]

Answer:_____

_____

_____

3. In the third paragraph, what tells us that the narrator's family suspected that he would not want to go to school? [1 mark]

Answer:_____

4. "I ain't. I'm stopping 'ome." Rewrite this in correct English. [1 mark]

Answer:_____

5. a. What does Laurie do to try and stop them from sending him to school? [1 mark]

Answer:_____

b. What eventually convinces Laurie to go to school? [2 marks]

Answer:_____

_____

6. a. Underline what figure of speech this is: [1 mark]

"The playground roared like a rodeo."

i. metaphor

ii. simile

iii. alliteration

6. b. Do you think the figure of speech is effective? Why? [1 mark]

Answer:_____

7. Underline the correct answer. The pupils show "hideous interest" in Laurie. This means? [1 mark]

a. They were ugly but interesting.

b. They were interested in how ugly Laurie was.

c. Laurie did not like the way they showed their interest in him.

d. Laurie found them interesting but ugly.

8. The teacher told Laurie to "sit there for the present".

a. What did the teacher mean? [1 mark]

Answer:_____

b. What did Laurie think the teacher meant? [1 mark]

Answer:_____

9. How do we know that Laurie did not take long to settle into school life? [1 mark]

Answer:_____

10. In the paragraph which describes the playground, find a word that means: "small pieces of metal from an exploding bomb or grenade." [1 mark]

Answer:_____

11. Write the meaning of the following words as they are used in the passage. [3 marks]

a. jumbled _____

b. hovels _____

c. gracious _____

Total: / 20

My Chapter 3 Score: / 54 = _____ %

Well done for completing chapter three. In this chapter you have used your mathematical reasoning skills to find the Lowest Common Multiple by using prime factors. You've also used your decoding skills to find meaning in letters, a tricky skill to master but one which will be particularly useful as you transition from primary to secondary education. Once again, you're mastering your language inference skills, looking deeper at text to explore the meaning and context of the piece.

Understanding and Applying: Mathematical Reasoning, Verbal Reasoning and Language Inference Answers

ANSWERS

CHAPTER 1

SECTION A – MATHEMATICAL REASONING [15 marks]

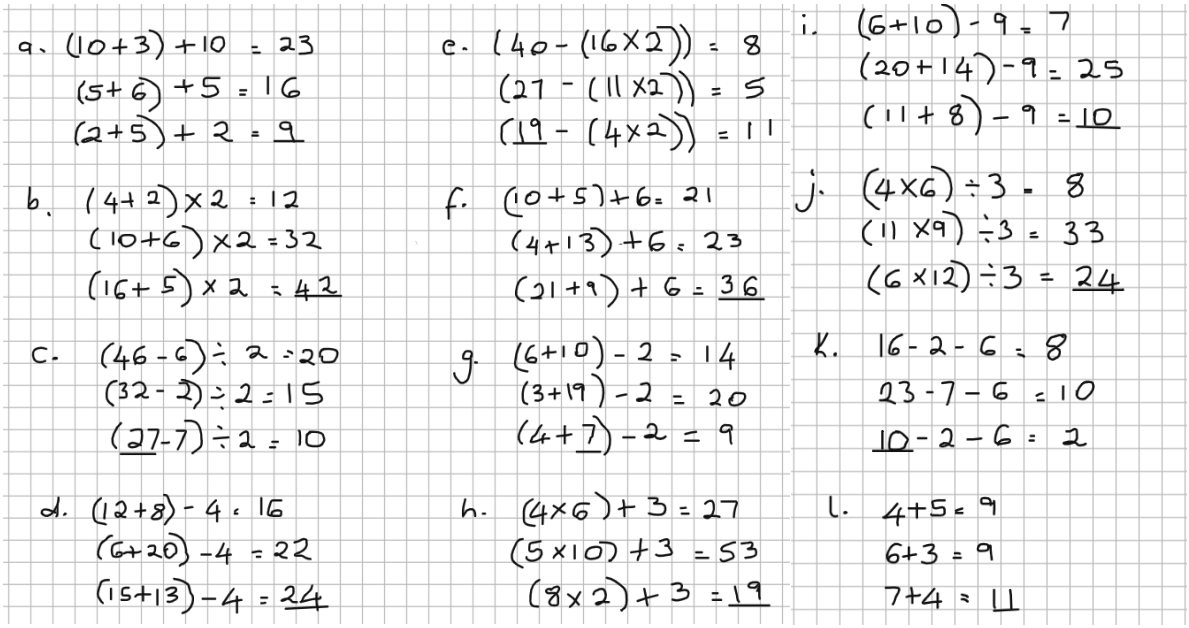
1. a. 6°C b. 7°C c. -1°C d. 0°C e. -15°C
2. a. 10°C b. 8°C c. 5.5°C d. 198°C e. 17°C
3. 50m
4. 2°C
5. a. -4 b. -8 c. -30

SECTION B – VERBAL REASONING [24 marks]

1.
a. G
b. L
c. P
d. Y
e. N
f. F
g. B
h. W
i. Y
j. R
k. L
l. B

2.
a. 9 $(2 + 5 + 2)$
b. 42 $((16 + 5) \times 2)$
c. 27 $(10 \times 2 + 7)$
d. 24 $(2 + 5 + 2)$
e. 19 $(4 \times 2 + 11)$
f. 36 $(21 + 9 + 6)$
g. 7 $(9 - 4 + 2)$
h. 19 $(8 \times 2 + 3)$
i.10 $(11 + 8 - 9)$
j. 24 $(6 \times 12 \div 3)$
k. 10 $(10 - 2 - 6 = 2)$
l. 11$(7 + 4)$

Working out – examples - questions 2 a - l.



SECTION C – LANGUAGE INFERENCE [19 marks]

1. It is written in capital letters to show that she is shouting. [1 mark]
2. "The pride of her heart" means that she loved her glasses very much and was very proud of them. [1 mark]
3. The old lady's spectacles are stylish spectacles that she bought for their appearance and not necessarily to help her to see better. [2 marks]
4. She punches under the bed with a broom because she thinks that the boy is hiding under there. [1 mark]
5. We know she is unsuccessful because she manages only to find the cat under the bed and not Tom. [1 mark]
6. "Resurrected" means 'brought back to life' or discovered. [1 mark]
7. The boy had been hiding in the cupboard. [1 mark]
8. He had been hiding because he had been secretly eating jam, which he wasn't allowed to do. [1 mark]
9. A "switch" is a stick that aunt Polly wants to beat Tom with. [1 mark]
10. "The peril was desperate" means that the danger was immediate and serious. He was about to be punished in the next second. [1 mark]
11. The boy escapes from his aunt by pretending he had seen something frightening behind her. [1 mark]
12. She laughs when the boy escapes. [1 mark]
13. We know that the boy has done the same thing before because she says that he has often played tricks on her like that before. [1 mark]
14. The saying means that you can't make someone learn something new when they are set in their ways and used to doing things their own way. [1 mark]
15. a. "I have never seen another boy like that before."
    b. "What is that stuff on your face?"
    c. "Forty times I've said if you don't leave the jam alone, I'll beat you!" [3 marks]
16. The punctuation tells us that the old lady is stretching the words out as she shouts it. She is saying it slowly so that he can hear her calling him. [1 mark]

ANSWERS

CHAPTER 2

SECTION A – MATHEMATICAL REASONING [15 marks]

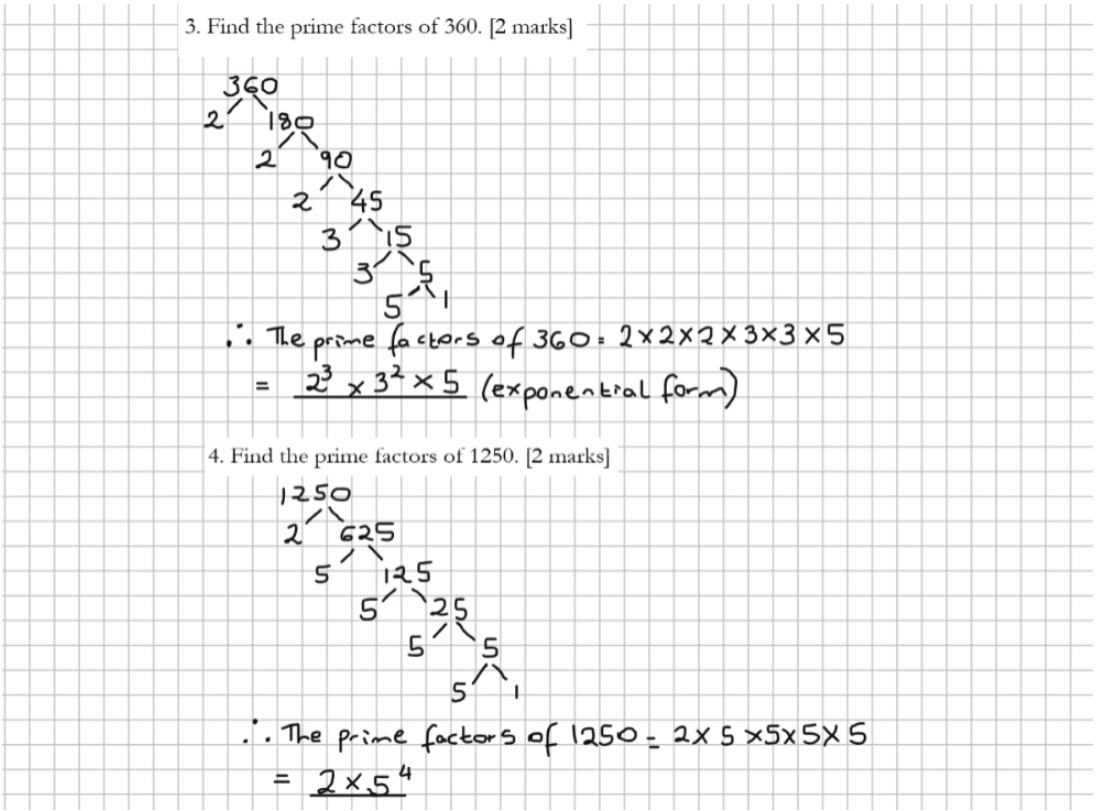
1. 24, 36 and 48
2. 53, 59, 61 and 67 (51 is not prime because $3 \times 17 = 51$ and 57 is not prime because $3 \times 19 = 57$)
3. $2^3 \times 3^2 \times 5$
4. 2×5^4
5. 5
6. 2^2

7.a. 2^4

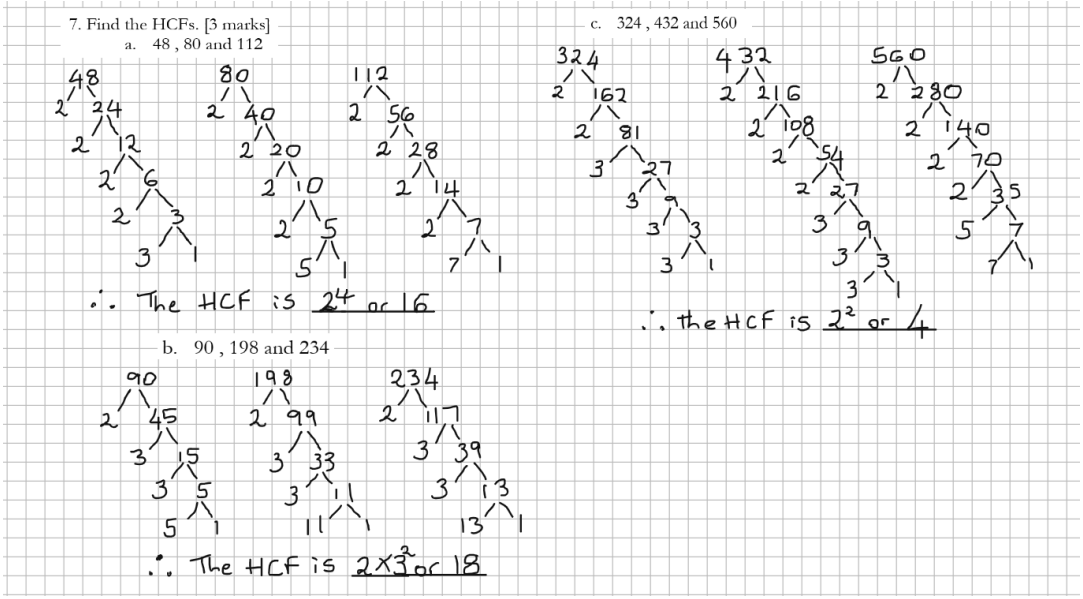
b. 2×3^2

c. 2^2

Working out – examples - questions 3 - 4.



Working out – examples - question 7 a - c.



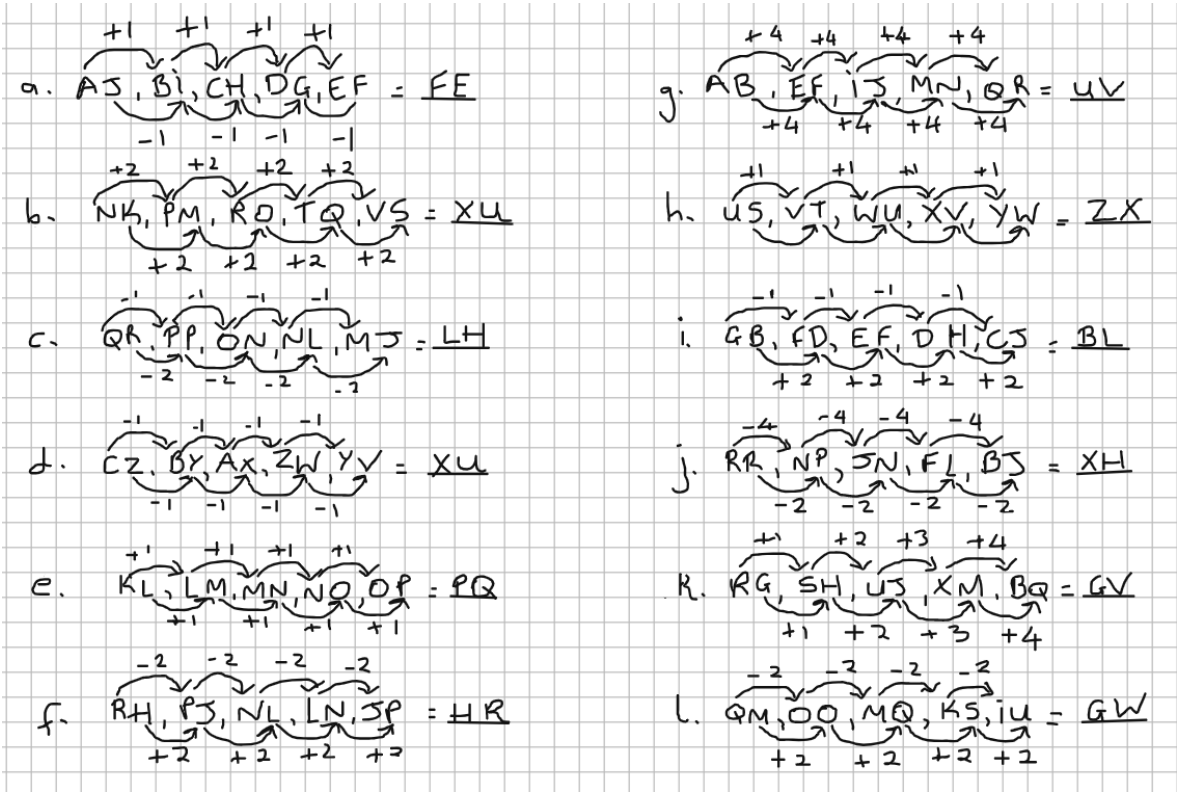
SECTION B – VERBAL REASONING [24 marks]

1.
a. cat / dog
horse, *duck* and *chicken* are farm animals, whereas c*at* and *dog* are not.
b. planet / space
Venus, *Earth* and *Mars* are planets, whereas *planet* and *space* are not.
c. cooker / eat
boil, *roast* and *fry* are ways to cook particular foods, whereas c*ooker* and *eat* are not.
d. judo / swimming
cricket, *rugby* and *football* are sports that involve a ball, whereas *swimming* and *judo* don't.
e. horse / pig
lamb, *calf* and *foal* are baby animals, whereas *horse* and *pig* are not.
f. father / nephew
mother, *daughter* and *sister* are female, whereas *father* and *nephew* are male.
g. unusual / untied
unwell, *ill* and *sick* are adjectives describing health, *unusual* and *untied* are not.
h. knife / spoon
plate, *cup* and *saucer* are crockery, whereas *knife* and *spoon* are cutlery to eat with.
i. strawberry / pear
carrot, *bean* and *lettuce* are vegetables, whereas *strawberry* and *pear* are fruits.
j. actress / girl
uncle, *boy* and *master* are male, whereas *actress* and *girl* are female.
k. orange / banana
pair, *couple* and *duo* are a set of two things, whereas *orange* and *banana* are fruits.
l. mower / trimmer
grass, *bush* and *plant* are types of greenery, whereas *mower* and *trimmer* are tools to shape and cut with.

2.
a. FE

b. XU
c. LH
d. XU
e. PQ
f. HR
g. UV
h. ZX
i. BL
j. XH
k. GV
l. GW

Working out – examples - questions 2 a - l.



SECTION C – LANGUAGE INFERENCE [21 marks]

1. A shack is a small, rundown building used as a shelter. A shack is similar to a hut. [1 mark]
2. Tank is referring to the roof of the shack. [1 mark]
3. During the eye of the hurricane, the storm stops so it is not as dangerous. [1 mark]
4. 'Poacher'. Frank is a poacher which means that he hunts and kills animals illegally. [2 marks]
5. A "momentary lull" is a short time of calm or quiet. [1 mark]
6. "Greater natural fury" refers to the violent and wild effects of the storm. It means that the storm was going to get worse as soon as the eye of the storm had passed by. [2 marks]
7. The group found it difficult to climb up the hillside because it was slippery. There were fallen trees and shrubs and there was a lot of mud and muddy areas from mudslides. [3 marks]
8. Josh had "renewed hope" because he imagined that his father and Dr Nakamura were alive in the cave. [1 mark]
9. slippery [1 mark]

10. a. muttered
    b. fallen
    c. base
    d. anger / violence [4 marks]
11. a. feeble / weak
    b. stopped / ceased / ended
    c. hopelessly / despairingly
    d. trickled [4 marks]

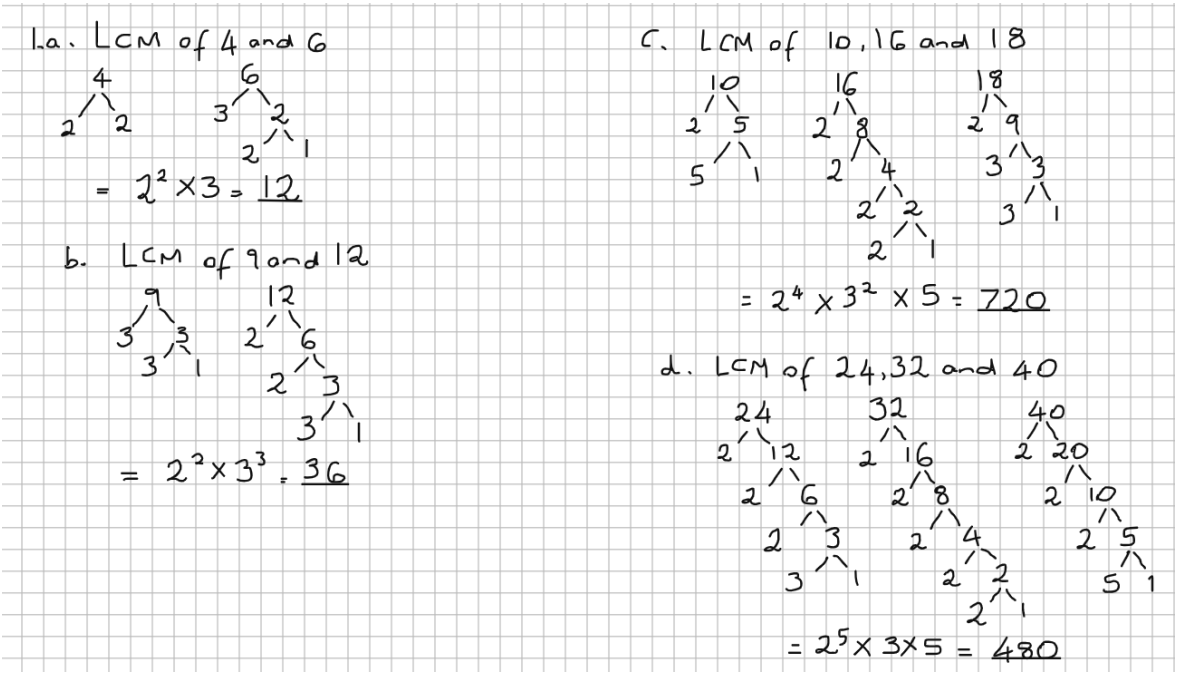
ANSWERS

CHAPTER 3

SECTION A – MATHEMATICAL REASONING [10 marks]

1. a. $2 \times 2 \times 3 = 12$
   b. $2 \times 2 \times 3 \times 3 = 36$
   c. $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 720$
   d. $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 = 480$
   e. $2 \times 3 \times 3 \times 5 \times 5 \times 19 = 8550$
   f. $2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 7 \times 11 = 92400$
2. $2 \times 2 \times 2 \times 3 = 24$g
3. $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 7 = £50.40$
4. $2 \times 2 \times 2 \times 3 \times 5 = 120$ marbles
5. $2 \times 2 \times 3 \times 3 = 36$

Working out – examples - questions 1a - d.

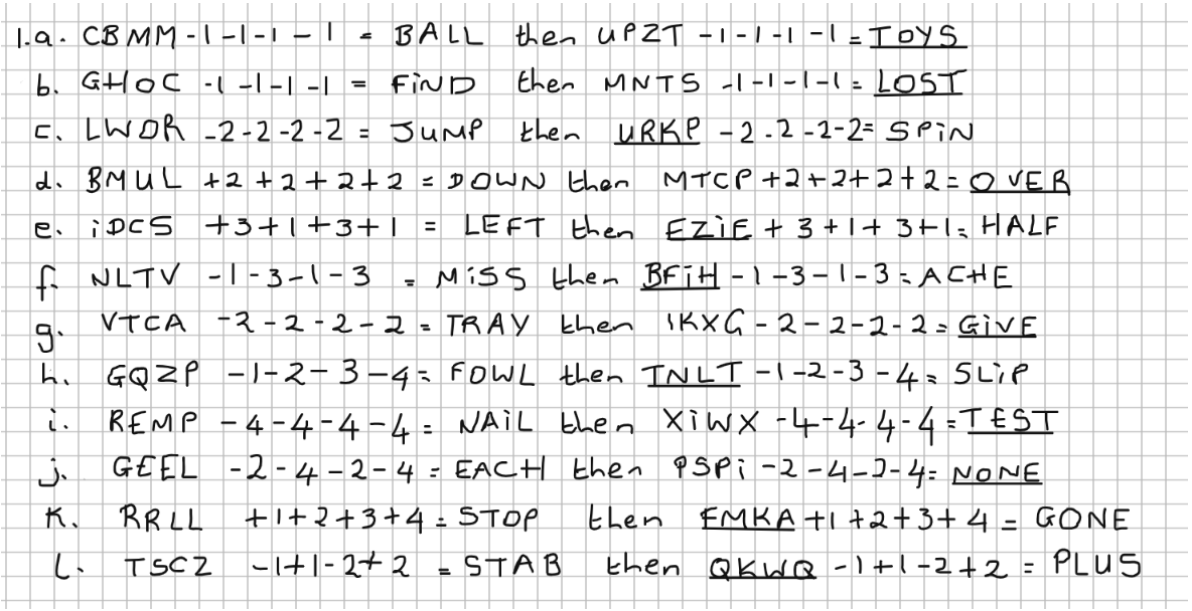


SECTION B – VERBAL REASONING [24 marks]

1.
a. TOYS

b. LOST
c. URKP
d. OVER
e. EZIE
f. BFIH
g. GIVE
h. TNLT
i. TEST
j. NONE
k. FMKA
l. QKWQ

Working out – examples - questions 1 a - l.



2.
a. bottom/outside
b. green / yellow
c. herd / flock
d. some / son
e. eight / five
f. expensive / never
g. dirty / scrape
h. multiply / subtract
i. glove / sock
j. see / tired
k. fruit / veg
l. heavy / loose

SECTION C – LANGUAGE INFERENCE [20 marks]

1. a. It was a better education than his grandparents had. [1 mark]
2. The wild boys and girls brought to school with them strange swear words and sayings, odd smells, old-fashioned clothes and strange food like pies. [4 marks]

3. They didn't tell him that he was going to school, just surrounded him and carried him off to school. [1 mark]
4. I am not. I am staying at home. [1 mark]
5. a. He cries and kicks. [1 mark]
   b. His sisters threaten him that if he doesn't go to school, he will be put in a box, turned into a rabbit and chopped up on Sunday. [2 marks]
6. a. ii) simile [1 mark]
   b. It is effective because a rodeo is full of wild, galloping horses with plenty of action, just as the playground seems full of noise, dust and wild creatures to the little boy. [1 mark]
7. c. Laurie did not like the way they showed their interest in him. [1 mark]
8. a. The teacher meant that Laurie must sit there for a while. [1 mark]
   b. Laurie thought she was going to give him a gift. [1 mark]
9. Laurie did not take long to settle into school life because he soon stole an apple to replace his potato which was stolen. [1 mark]
10. A word that means the same as small pieces of metal exploding is "shrapnel." [1 mark]
11. a. muddled, mixed-up.
    b. slums, shacks, shanties, huts, ruins.
    c. polite, well-mannered, generous. [3 marks]