

## **KEY STAGE 3 LEVEL:**

### **SECTION 1: NUMBER 1**

#### **Part**

#### **Contents**

- 1. WEIGHTS AND MEASURES**  
Metric / Imperial Conversions  
Temperature Scales: Celsius, Fahrenheit & Kelvin  
Part 1: Exercise  
Part 1: Answers to Exercise
  
- 2. I. ARITHMETICAL OPERATIONS ON NUMBERS**  
Sum  
Difference  
Product  
Quotient  
Order of Operations  
**II. SETS OF NUMBERS:**  
Natural Numbers  
Whole Numbers  
Integer Numbers  
Rational Numbers  
Irrational Numbers  
Real Numbers

## Venn Diagram to illustrate Sets of Numbers

### **III. TYPES OF NUMBERS:**

Prime Numbers

Even Numbers

Odd Numbers

Square Numbers

Cubic (or cube) Numbers

Triangular Numbers

Fibonacci Numbers

Multiple

Factor

Lowest Common Multiple (**L.C.M.**)

Highest Common Factor (**H.C.F.**)

Prime Factor

Part 2: Exercise

Part 2: Answers to Exercise

### **3. LONG MULTIPLICATION AND LONG DIVISION**

Cayley Multiplication Table [Up to 12-times tables.]

Part 3: Exercise

Part 3: Answers to Exercise

**4. DIRECTED NUMBERS:**

Number Line

Part 4: Exercise

Part 4: Answers to Exercise

**5. INDICES & STANDARD FORM:**

Laws of Indices

Standard Form:  $A \times 10^n$

**6. ROUNDING OFF:**

Decimal Places

Significant Figures

**7. UPPER & LOWER BOUNDS**

**8. APPROXIMATIONS**

Parts 5, 6, 7 and 8: Exercise

Parts 5, 6, 7 and 8: Exercise: Answers

## **SECTION 2: NUMBER 2**

### **Part**

### **Contents**

**1.**

#### **FRACTIONS**

What is a fraction?

Equivalent Fractions

Lowest Terms

Proper Fractions

Improper Fraction

Mixed Number

Addition of Fractions

Subtraction of One Fraction from Another

Multiplication of Fractions

Division of One Fraction by Another

Finding a Fraction of a Quantity

One Quantity expressed as Fraction of Another

Worked Practical Examples: Fractions

Part 1: Exercise

Part 1: Exercise: Answers

**2. DECIMAL NUMBERS**

Place Values

Changing Decimals into Fractions

Changing Fractions into Decimals

Addition: Decimals

Subtraction: Fractions

Multiplication: Decimals

Division: Decimals

Part 2: Exercise

Part 2: Exercise: Answers

**3. PERCENTAGES**

What is a percentage?

Finding a Percentage of a Quantity

One Quantity as a Percentage of Another

Part 3: Exercise

Part 3: Exercise: Answers

**4. SIMPLE AND COMPOUND INTEREST**

Simple Interest

Simple Interest Formula

Compound Interest

Compound Interest Formula

Appreciation / Depreciation

Part 4: Exercise

Part 4: Exercise: Answers

## **SECTION 3: NUMBER 3**

### **Part**

### **Contents**

**1.**

#### **RATIO**

Unequal Sharing using Ratio

Other Types of Unequal Sharing

Part 1: Exercise

Part 1: Exercise: Answers

**2.**

#### **FOREIGN EXCHANGE**

Rate of Exchange

Changing Sterling into a Foreign Currency

Changing a Foreign Currency into Sterling

Part 2: Exercise

Part 2: Exercise: Answers

**3.**

#### **AVERAGE SPEED, DISTANCE AND TIME:**

#### **TRAVEL GRAPHS**

Mnemonic (i.e. aid to memorization)

Distance / Time Graphs

Worked Examples

Part 3: Exercise

Part 3: Exercise: Answers

## **SECTION 4: SHAPES:**

**PART 1: SHAPES**

**PART 2: ANGLES**

### **Part**

### **Contents**

**1.**

#### **SHAPES**

#### **Triangles:**

Scalene

Isosceles

Equilateral

Area

Pythagoras's Theorem

Similar Triangles

Congruent Triangles

#### **Quadrilaterals:**

#### **Properties of:**

Square

Rectangle

Parallelogram

Rhombus

Kite

Trapezium

## **Polygons:**

Pentagon

Hexagon

Heptagon

Octagon

## **The Circle:**

Diameter

Radius

Circumference

Area

Sector Area

Arc Length

## **Prism:**

Solid of Constant Cross - Section

## **Length, Area and Volume:**

Nets

## **Symmetry:**

**Line** Symmetry

**Plane** Symmetry

**Point** Symmetry

**Rotational** Symmetry

**Order** of Rotational Symmetry

Part 1: Exercise

Part 1: Answers to Exercise

2.

**ANGLES:**

Acute

Obtuse

Reflex

Right Angle

Straight Line

Circle

Drawing Angles using a Protractor

**Angle Properties of Straight lines:**

**Vertically Opposite** Angles

**Corresponding** Angles

**Alternate** Angles

**Interior** Angles

Part 2: Exercise

Part 2: Answers to Exercise

3.

**DIRECTIONS:**

**Cardinal Points:** N, S, E, W, NE, SE, SW, NW

**Three - Figure Bearings**

Part 3: Exercise

Part 3: Answers to Exercise

## SECTION 5: ALGEBRA

### Part

### Contents

1.

#### **INTRODUCTION TO ALGEBRA:**

What is Algebra?

#### **The four rules:**

Addition

Subtraction

Multiplication

Division

#### **Brackets**

#### **Powers**

#### **Like Terms**

Simplifying

Part 1: Exercise 1

#### **Practical Applications**

Part 1: Exercise 2

Part 1: Exercise 1: Answers

Part 1: Exercise 2: Answers

2.

**EQUATIONS:**

**Simple Equations**

**Construction of Simple Equations**

**Algebraic Fractional Equations**

Part 2: Exercise

Part 2: Exercise: Answers

3.

**INEQUATIONS: THE NUMBER LINE:**

**Simple Inequations**

**The Number Line**

**Algebraic Fractional Inequations**

Part 3: Exercise

Part 3: Exercise: Answers

4.

**SIMULTANEOUS EQUATIONS:**

**Solution by the method of Elimination**

**Positive and Negative values of  $x$  and  $y$**

**Solution by Graphical method**

Part 4: Exercise

Part 4: Exercise: Answers

## SECTION 6:

### HANDLING DATA: STATISTICS & PROBABILITY

#### Part

#### Contents

1.

**STATISTICS:**

**Averages:**

Mean

Median

Mode

**Tally Chart:**

Raw Data

Frequency Table

Mean

Median

Mode

**Pie Chart**

Calculation of Sector Angles

**Bar Graph**

**Range**

Part 1: Exercise

Part 1: Exercise: Answers

**2.**

## **PROBABILITY**

Definition of Probability

Probability Scale

Laws of Probability

Probability Tree

Worked Examples

Part 2: Exercise

Part 2: Exercise: Answers

# PRACTICE PAPER 1: NUMBER 1

[Based on Section 1.]

<b><u>Part</u></b>	<b><u>Contents</u></b>
<b>1.</b>	<b>WEIGHTS AND MEASURES</b> Metric / Imperial Conversions Temperature Scales: Celsius & Fahrenheit Part 1: Exercise Part 1: Answers to Exercise
<b>2.</b>	<b>I. ARITHMETICAL OPERATIONS ON NUMBERS</b> Sum Difference Product Quotient Order of Operations <b>II. SETS OF NUMBERS:</b> Natural Numbers Whole Numbers Integer Numbers Rational Numbers Irrational Numbers Real Numbers Venn Diagram to illustrate Sets of Numbers

### **III. TYPES OF NUMBERS:**

Prime Numbers

Even Numbers

Odd Numbers

Square Numbers

Cubic (or cube) Numbers

Triangular Numbers

Fibonacci Numbers

Multiple

Factor

Lowest Common Multiple (**L.C.M.**)

Highest Common Factor (**H.C.F.**)

Prime Factor

Part 2: Exercise

Part 2: Answers to Exercise

### **3. LONG MULTIPLICATION AND LONG DIVISION**

Cayley Multiplication Table [Up to 12-times tables.]

Part 3: Exercise

Part 3: Answers to Exercise

**4. DIRECTED NUMBERS:**

Number Line

Part 4: Exercise

Part 4: Answers to Exercise

**5. INDICES & STANDARD FORM:**

Laws of Indices

Standard Form:  $A \times 10^n$

**6. ROUNDING OFF:**

Decimal Places

Significant Figures

**7. UPPER & LOWER BOUNDS**

**8. APPROXIMATIONS**

Parts 5, 6, 7 and 8: Exercise

Parts 5, 6, 7 and 8: Exercise: Answers

# **PRACTICE PAPER 2: NUMBER 2**

[Based on Section 2: Number 2.]

## **Part**

## **Contents**

**1.**

### **FRACTIONS**

What is a fraction?

Equivalent Fractions

Lowest Terms

Proper Fractions

Improper Fraction

Mixed Number

Addition of Fractions

Subtraction of One Fraction from Another

Multiplication of Fractions

Division of One Fraction by Another

Finding a Fraction of a Quantity

One Quantity expressed as Fraction of Another

Worked Practical Examples: Fractions

Part 1: Exercise

Part 1: Exercise: Answers

**2. DECIMAL NUMBERS**

Place Values

Changing Decimals into Fractions

Changing Fractions into Decimals

Addition: Decimals

Subtraction: Fractions

Multiplication: Decimals

Division: Decimals

Part 2: Exercise

Part 2: Exercise: Answers

**3. PERCENTAGES**

What is a percentage?

Finding a Percentage of a Quantity

One Quantity as a Percentage of Another

Part 3: Exercise

Part 3: Exercise: Answers

**4. SIMPLE AND COMPOUND INTEREST**

Simple Interest

Simple Interest Formula

Compound Interest

Compound Interest Formula

Appreciation / Depreciation

Part 4: Exercise

Part 4: Exercise: Answers

## **PRACTICE PAPER 3:**

[Based on Section 3: Number 3.]

### **Part**

### **Contents**

**1.**

#### **RATIO**

Unequal Sharing using Ratio

Other Types of Unequal Sharing

Part 1: Exercise

Part 1: Exercise: Answers

**2.**

#### **FOREIGN EXCHANGE**

Rate of Exchange

Changing Sterling into a Foreign Currency

Changing a Foreign Currency into Sterling

Part 2: Exercise

Part 2: Exercise: Answers

**3.**

#### **AVERAGE SPEED, DISTANCE AND TIME:**

#### **TRAVEL GRAPHS**

Mnemonic (i.e. aid to memorization)

Distance / Time Graphs

Worked Examples

Part 3: Exercise

Part 3: Exercise: Answers

# PRACTICE PAPER 4:

[Based on Section 4.]

**PART 1: SHAPES**

**PART 2: ANGLES**

**PART 3: DIRECTIONS**

<b><u>Part</u></b>	<b><u>Contents</u></b>
<b>1.</b>	<b>SHAPES</b>
	<b>Triangles:</b>
	Scalene
	Isosceles
	Equilateral
	Area
	Pythagoras's Theorem
	Similar Triangles
	Congruent Triangles
	<b>Quadrilaterals:</b>
	<b>Properties of:</b>
	Square
	Rectangle
	Parallelogram
	Rhombus
	Kite
	Trapezium

## **Polygons:**

Pentagon

Hexagon

Heptagon

Octagon

## **The Circle:**

Diameter

Radius

Circumference

Area

Sector Area

Arc Length

## **Prism:**

Solid of Constant Cross - Section

## **Length, Area and Volume:**

Nets

## **Symmetry:**

**Line** Symmetry

**Plane** Symmetry

**Point** Symmetry

**Rotational** Symmetry

**Order** of Rotational Symmetry

Part 1: Exercise

Part 1: Exercise: Answers

**2. ANGLES:**

Acute

Obtuse

Reflex

Right Angle

Straight Line

Circle

Drawing Angles using a Protractor

**Angle Properties of Straight lines:**

**Vertically Opposite** Angles

**Corresponding** Angles

**Alternate** Angles

**Interior** Angles

Part 2: Exercise

Part 2: Exercise: Answers

**3. DIRECTIONS:**

**Cardinal Points:** N, S, E, W, NE, SE, SW, NW

**Three - Figure Bearings**

Part 3: Exercise

Part 3: Exercise: Answers

# PRACTICE PAPER 5: ALGEBRA

[Based on Section 5.]

## Part

## Contents

### 1. INTRODUCTION TO ALGEBRA:

What is Algebra?

**The four rules:**

Addition

Subtraction

Multiplication

Division

**Brackets**

**Powers**

**Like Terms**

Simplifying

Part 1: Exercise 1

**Practical Applications**

Part 1: Exercise 2

Part 1: Exercise 1: Answers

Part 1: Exercise 2: Answers

2.

**EQUATIONS:**

**Simple Equations**

**Construction of Simple Equations**

**Algebraic Fractional Equations**

Part 2: Exercise

Part 2: Exercise: Answers

3.

**INEQUATIONS: THE NUMBER LINE:**

**Simple Inequations**

**The Number Line**

**Algebraic Fractional Inequations**

Part 3: Exercise

Part 3: Exercise: Answers

4.

**SIMULTANEOUS EQUATIONS:**

**Solution by the method of Elimination**

**Positive and Negative values of  $x$  and  $y$**

**Solution by Graphical method**

Part 4: Exercise

Part 4: Exercise: Answers

# PRACTICE PAPER 6:

[Based on Section 6.]

## HANDLING DATA: STATISTICS & PROBABILITY

### Part

### Contents

1.

#### STATISTICS:

##### Averages:

Mean

Median

Mode

##### Tally Chart:

Raw Data

Frequency Table

Calculation of Mean

Median

Mode

##### Pie Chart

Calculation of Sector Angles

##### Bar Graph

##### Range

Part 1: Exercise

Part 1: Exercise: Answers

**2.**

**PROBABILITY:**

Definition of Probability

Probability Scale

Laws of Probability

Probability Tree

Worked Examples

Part 2: Exercise

Part 2: Exercise: Answers