

# Year 7 Maths

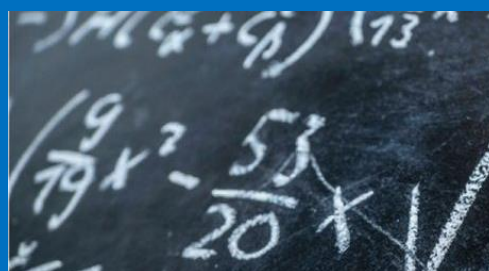
## Knowledge Organiser

### Term 3

|              |               |
|--------------|---------------|
| <b>Name:</b> | <b>Class:</b> |
|--------------|---------------|

| Keyword    | Definition  |
|------------|---|
| Median     | The middle number in an ordered list.   |
| Range      | The difference between the smallest and largest values in a data set.                           |
| Mean       | The sum of all the data divided by how many data there are.                                     |
| Mode       | The most common piece of data.  |
| Average    | An indication of the typical value.   |
| Simplify   | To make simpler or easier to understand by reducing the size of numbers or the number of terms. |
| Like terms | Terms which have the exact same letters in an expression.                                       |
| Expression | One or more terms combined by addition or subtraction.  |
| Function   | A special relationship where each input has one output.   |
| Substitute | Replace something in an expression with something else which is equal to it.                    |

|                        |  |
|------------------------|--|
| <b>Homework 1 due:</b> |  |
| <b>Homework 2 due:</b> |  |
| <b>Homework 3 due:</b> |  |



# Term 3 Overview

## Big Questions for the term

### Ratio and Proportion

- How do I write ratio?
- How is ratio linked to fractions and percentages?
- How can we model ratio questions?
- What is unitary ratio?
- Which is the best buy?
- How does proportion relate to recipes?
- How does speed relate to ratio and proportion?

### Simplifying and Substitution

- Why do we use algebra?
- How do we use algebra to write expressions?
- How can we simplify an expression?

## Knowledge Retrieval Questions – From Term 1

### Unit 1 – Calculations and Accuracy

| #  | Question  | Answer  |
|----|---|---|
| 1  | What does the word sum mean?  | The result of addition.   |
| 2  | What does consecutive mean?   | Following each other continuously.  |
| 3  | How do you find the difference between two numbers?                     | Subtract the smaller number from the larger one.                            |
| 4  | What should your answer be if the question tells you to calculate?      | A number  |
| 5  | What should your answer be if the question tells you to evaluate?       | A number  |
| 6  | How do you divide a number by 10?                                       | Move all the digits 1 place to the right                                    |
| 7  | How do you multiply a number by 10?                                     | Move all the digits 1 place to the left                                     |
| 8  | What is subtracting a negative number equivalent to?                    | Adding a positive number  |
| 9  | What is adding a negative number equivalent to?                         | Subtracting a positive number   |
| 10 | What is a term-to-term rule?  | A rule telling you how to get from one term to the next in a sequence       |
| 11 | In a sequence, what is meant by a term?                                 | One of the numbers in the sequence  |
| 12 | What is the first step when trying to find the next term in a sequence? | Identify the pattern.   |
| 13 | What is a linear sequence?  | A number pattern which increases or decreases by the same amount each time. |
| 14 | How do you work out the value of a digit in a long number?              | Ignore every other digit (make them zeroes)                                 |
| 15 | How do you add decimals?  | Same method as usual, lining up the decimal points                          |
| 16 | How do you subtract decimals?   | Same method as usual, lining up the decimal points                          |

### Unit 2 – Integers, Powers and Roots

| #  | Question   | Answer   |
|----|--|--|
| 1  | What does the word product mean?   | The result of a multiplication.                        |
| 2  | What sign would the product of 2 negative numbers have?                            | Positive   |
| 3  | What sign would the product of a positive and a negative number have?              | Negative   |
| 4  | What sign would the answer to a negative number divided by a positive number have? | Negative   |
| 5  | What is the definition of a square number?   | The product of a number and itself                     |
| 6  | List the first 15 square numbers.  | 1,4,9,16,25,36,49,64,81,100,121,144,169,196,225        |
| 7  | What is the definition of a factor?  | A number which divides another number exactly.         |
| 8  | What is the definition of a multiple?  | A number in another number's times table.              |
| 9  | What does HCF stand for?   | Highest Common Factor                                  |
| 10 | What does LCM stand for?   | Lowest Common Multiple                                 |
| 11 | What is a cube number?   | The product of 3 equal numbers.                        |
| 12 | How do you divide by a fraction?   | Multiply by its reciprocal (the fraction flipped over) |

## Knowledge Retrieval Questions – From Term 2

### Unit 3 – Measures

| # | Question                                  | Answer           |
|---|---|------------------|
| 1 | How do you convert millimetres to metres? | Divide by 1000   |
| 2 | How do you convert metres to centimetres? | Multiply by 100  |
| 3 | How do you convert metres to kilometres?  | Divide by 1000   |
| 4 | How do you convert hours into minutes?    | Multiply by 60   |
| 5 | How do you convert seconds into minutes?  | Divide by 60     |
| 6 | How do you convert kilograms into grams?  | Multiply by 1000 |
| 7 | How do you convert kilograms into tonnes? | Divide by 1000   |
| 8 | How do you convert litres to millilitres? | Multiply by 1000 |

### Unit 4 – Fractions, decimals and percentages

| #  | Question  | Answer  |
|----|---|---|
| 1  | What is a numerator?  | Top number in a fraction  |
| 2  | What is a denominator?  | Bottom number in a fraction   |
| 3  | What operation does a fraction represent?   | Division  |
| 4  | Which operation do we use for the word 'of'?                                      | Multiplication  |
| 5  | What's the first step when adding or subtracting fractions?                       | Write the fractions with a common denominator   |
| 6  | How do you multiply fractions?  | Multiply the numerators and multiply the denominators.  |
| 7  | How do you convert a decimal to a percentage?                                     | Multiply by 100 (%)   |
| 8  | How do you simplify fractions?  | Divide both the numerator and denominator by a common factor.   |
| 9  | How do you find an equivalent fraction?   | Multiply or divide the numerator and denominator by the same number.  |
| 10 | How do you convert a mixed number to an improper fraction?                        | Multiply the whole number by the denominator and add it to the numerator  |
| 11 | How do you find a fraction of an amount?  | Divide the amount by the denominator and multiply by the numerator.   |
| 12 | What does percent mean?   | Out of 100  |
| 13 | How do you convert a fraction to a decimal if the denominator is a factor of 100? | Write the equivalent fraction with a denominator of 100 (then divide by 100)                                      |
| 14 | How do you convert a decimal to a fraction?                                       | The numerator is the same digits without the decimal point, the denominator is the place value of the last digit. |
| 15 | How do you convert a percentage to a decimal?                                     | Divide by 100 (%)   |

## Knowledge Retrieval Questions – From Term 3

### Unit 5 – Ratio and Proportion

| # | Question                                    | Answer  |
|---|---|---|
| 1 | How do you simplify a ratio?                | Divide both numbers by a common factor.                                 |
| 2 | How do you write a ratio into the form 1:n? | Divide both numbers in the ratio by the first number in the ratio.      |
| 3 | What is the unitary method?                 | A method where the first step is making the ratio 1:n or n:1            |
| 4 | How do you calculate best value?            | Work out the cost of the same amount for each option and compare those. |
| 5 | How do you share an amount in a ratio?      | Add the ratio numbers and divide by that to get the value of each part. |

### Unit 6 – Simplifying and substitution

| # | Question  | Answer  |
|---|---|---|
| 1 | In algebra, what does "collecting like terms" mean?       | Adding or subtracting terms with the exact same letters                                   |
| 2 | In algebra, what is substitution?                         | Replacing something in an expression with something else which is equal to it             |
| 3 | The symbol for which operation is not written in algebra? | Multiplication  |
| 4 | How is division represented algebraically?                | As a fraction   |
| 5 | How do you write expressions from sentences?              | Replace unknown numbers with letters, everything else should be a number or an operation. |

**Term 3 - Homework 1**

| # | Type          | Question   | Answer |
|---|---------------|--|--------|
| 1 | Knowledge     | How do you find an equivalent fraction?                  |        |
|   | Application 1 | State a fraction which is equivalent to $\frac{9}{72}$   |        |
|   | Application 2 | State a fraction which is equivalent to $\frac{15}{180}$ |        |

|   |               |  |  |
|---|---------------|--|--|
| 2 | Knowledge     | How do you find a fraction of an amount? |  |
|   | Application 1 | Find $\frac{9}{11}$ of 66                |  |
|   | Application 2 | Find $\frac{20}{31}$ of 403              |  |

|   |               |   |  |
|---|---------------|---|--|
| 3 | Knowledge     | How do you convert a decimal to a percentage? |  |
|   | Application 1 | Convert 0.67 into a percentage.               |  |
|   | Application 2 | Convert 0.173 into a percentage.              |  |

|   |               |   |  |
|---|---------------|---|--|
| 4 | Knowledge     | How do you convert metres to centimetres? |  |
|   | Application 1 | Convert 8m into centimetres               |  |
|   | Application 2 | Convert 17m into centimetres              |  |

|   |               |   |  |
|---|---------------|---|--|
| 5 | Knowledge     | What is a denominator?  |  |
|   | Application 1 | What is the denominator in the fraction $\frac{4}{10}$ tenths?    |  |
|   | Application 2 | What is the denominator in the fraction $\frac{19}{70}$ sevenths? |  |

| # | Type          | Question                                    | Answer |
|---|---------------|---|--------|
| 6 | Knowledge     | How do you convert a decimal to a fraction? |        |
|   | Application 1 | Write 0.98 as a fraction.                   |        |
|   | Application 2 | Write 0.110 as a fraction.                  |        |

|   |               |   |  |
|---|---------------|---|--|
| 7 | Knowledge     | How do you convert a fraction to a decimal if the denominator is a factor of 100? |  |
|   | Application 1 | What is $\frac{2}{20}$ as a decimal?  |  |
|   | Application 2 | What is $\frac{5}{500}$ as a decimal?   |  |

|   |               |                                 |  |
|---|---------------|---------------------------------|--|
| 8 | Knowledge     | How do you simplify fractions?  |  |
|   | Application 1 | Fully simplify $\frac{14}{48}$  |  |
|   | Application 2 | Fully simplify $\frac{60}{120}$ |  |

|   |               |  |  |
|---|---------------|--|--|
| 9 | Knowledge     | What operation does a fraction represent?                      |  |
|   | Application 1 | What calculation would you do to write 8 tenths as a decimal?  |  |
|   | Application 2 | What calculation would you do to write 11 ninths as a decimal? |  |

|    |               |  |  |
|----|---------------|--|--|
| 10 | Knowledge     | What's the first step when adding or subtracting fractions?                |  |
|    | Application 1 | Complete the first step of the calculation $\frac{5}{16} + \frac{9}{8}$    |  |
|    | Application 2 | Complete the first step of the calculation $\frac{20}{27} + \frac{12}{18}$ |  |

| #  | Type          | Question                  | Answer |
|----|---------------|---------------------------|--------|
| 11 | Knowledge     | What does percent mean?   |        |
|    | Application 1 | Write 98% as a fraction.  |        |
|    | Application 2 | Write 110% as a fraction. |        |

|    |               |   |  |
|----|---------------|---|--|
| 12 | Knowledge     | How do you convert millimetres to metres? |  |
|    | Application 1 | Convert 9700mm into metres                |  |
|    | Application 2 | Convert 12400mm into metres               |  |

|    |               |  |  |
|----|---------------|--|--|
| 13 | Knowledge     | How do you convert metres to kilometres? |  |
|    | Application 1 | Convert 9800m into km                    |  |
|    | Application 2 | Convert 11000m into km                   |  |

|    |               |  |  |
|----|---------------|--|--|
| 14 | Knowledge     | How do you convert hours into minutes? |  |
|    | Application 1 | Convert 9 hours into minutes           |  |
|    | Application 2 | Convert 12 hours into minutes          |  |

|    |               |  |  |
|----|---------------|--|--|
| 15 | Knowledge     | How do you convert a mixed number to an improper fraction? |  |
|    | Application 1 | Convert 6 and $\frac{9}{10}$ into an improper fraction.    |  |
|    | Application 2 | Convert 13 and $\frac{15}{16}$ into an improper fraction.  |  |

## Workings Space

**Term 3 - Homework 2**

| # | Type          | Question                        | Answer |
|---|---------------|---------------------------------|--------|
| 1 | Knowledge     | How do you multiply fractions?  |        |
|   | Application 1 | Calculate $2/20 \times 1/10$    |        |
|   | Application 2 | Calculate $18/190 \times 13/90$ |        |

|   |               |  |  |
|---|---------------|--|--|
| 2 | Knowledge     | How do you convert a mixed number to an improper fraction? |  |
|   | Application 1 | Convert 9 and $9/10$ into an improper fraction.            |  |
|   | Application 2 | Convert 13 and $15/16$ into an improper fraction.          |  |

|   |               |  |  |
|---|---------------|--|--|
| 3 | Knowledge     | What is a denominator?                               |  |
|   | Application 1 | What is the denominator in the fraction 7 tenths?    |  |
|   | Application 2 | What is the denominator in the fraction 11 sevenths? |  |

|   |               |   |  |
|---|---------------|---|--|
| 4 | Knowledge     | What's the first step when adding or subtracting fractions? |  |
|   | Application 1 | Complete the first step of the calculation $8/16 + 5/8$     |  |
|   | Application 2 | Complete the first step of the calculation $12/27 + 15/18$  |  |

|   |               |  |  |
|---|---------------|--|--|
| 5 | Knowledge     | What is a numerator?                             |  |
|   | Application 1 | What is the numerator in the fraction 8 tenths?  |  |
|   | Application 2 | What is the numerator in the fraction 14 sixths? |  |

| # | Type          | Question  | Answer |
|---|---------------|---|--------|
| 6 | Knowledge     | Which operation do we use for the word 'of'?      |        |
|   | Application 1 | Write the calculation for 'Two thirds of 54'      |        |
|   | Application 2 | Write the calculation for 'Seven twelfths of 180' |        |

|   |               |  |  |
|---|---------------|--|--|
| 7 | Knowledge     | How do you calculate best value?   |  |
|   | Application 1 | SHOW which is better value, Shop A: 8 pens for 40p, or Shop B: 10 pens for 40p     |  |
|   | Application 2 | SHOW which is better value, Shop A: 16 pens for 240p, or Shop B: 18 pens for 288p? |  |

|   |               |   |  |
|---|---------------|---|--|
| 8 | Knowledge     | How do you convert a fraction to a decimal if the denominator is a factor of 100? |  |
|   | Application 1 | What is $\frac{2}{20}$ as a decimal?  |  |
|   | Application 2 | What is $\frac{8}{500}$ as a decimal?   |  |

|   |               |   |  |
|---|---------------|---|--|
| 9 | Knowledge     | How do you convert a decimal to a percentage? |  |
|   | Application 1 | Convert 0.42 into a percentage.               |  |
|   | Application 2 | Convert 0.154 into a percentage.              |  |

|    |               |  |  |
|----|---------------|--|--|
| 10 | Knowledge     | What is the unitary method?                      |  |
|    | Application 1 | 9 pens cost 135p. Work out the cost of 10 pens.  |  |
|    | Application 2 | 15 pens cost 180p. Work out the cost of 16 pens. |  |

| #  | Type          | Question                                      | Answer |
|----|---------------|---|--------|
| 11 | Knowledge     | How do you convert a percentage to a decimal? |        |
|    | Application 1 | Write 42% as a decimal.                       |        |
|    | Application 2 | Write 154% as a decimal.                      |        |

|    |               |                           |  |
|----|---------------|---------------------------|--|
| 12 | Knowledge     | What does percent mean?   |  |
|    | Application 1 | Write 34% as a fraction.  |  |
|    | Application 2 | Write 127% as a fraction. |  |

|    |               |  |  |
|----|---------------|--|--|
| 13 | Knowledge     | How do you find an equivalent fraction?                  |  |
|    | Application 1 | State a fraction which is equivalent to $\frac{9}{83}$   |  |
|    | Application 2 | State a fraction which is equivalent to $\frac{15}{124}$ |  |

|    |               |  |  |
|----|---------------|--|--|
| 14 | Knowledge     | How do you find a fraction of an amount? |  |
|    | Application 1 | Find $\frac{9}{11}$ of 99                |  |
|    | Application 2 | Find $\frac{20}{38}$ of 494              |  |

|    |               |   |  |
|----|---------------|---|--|
| 15 | Knowledge     | How do you write a ratio into the form 1:n? |  |
|    | Application 1 | Write the ratio 9:2 into the form 1:n       |  |
|    | Application 2 | Write the ratio 15:10 into the form 1:n     |  |

## Workings Space

**Term 3 - Homework 3**

| # | Type          | Question   | Answer |
|---|---------------|--|--------|
| 1 | Knowledge     | How do you calculate best value?   |        |
|   | Application 1 | SHOW which is better value, Shop A: 7 pens for 56p, or Shop B: 9 pens for 63p      |        |
|   | Application 2 | SHOW which is better value, Shop A: 16 pens for 192p, or Shop B: 18 pens for 234p? |        |

|   |               |   |  |
|---|---------------|---|--|
| 2 | Knowledge     | In algebra, what is substitution?               |  |
|   | Application 1 | Evaluate $8x + 2y$ , if $x = 8$ and $y = 7$     |  |
|   | Application 2 | Evaluate $12x + 13y$ , if $x = 12$ and $y = 16$ |  |

|   |               |                              |  |
|---|---------------|------------------------------|--|
| 3 | Knowledge     | How do you simplify a ratio? |  |
|   | Application 1 | Fully simplify 20:42         |  |
|   | Application 2 | Fully simplify 30:96         |  |

|   |               |   |  |
|---|---------------|---|--|
| 4 | Knowledge     | How do you write expressions from sentences?        |  |
|   | Application 1 | Write '10 lots of a number add 7' as an expression. |  |
|   | Application 2 | Write '15 more than k' as an expression.            |  |

|   |               |  |  |
|---|---------------|--|--|
| 5 | Knowledge     | In algebra, what does "collecting like terms" mean?        |  |
|   | Application 1 | Simplify the following expression: $10p + 8q - 2p + 8q$    |  |
|   | Application 2 | Simplify the following expression: $20p + 12q - 13p + 12q$ |  |

| # | Type          | Question  | Answer |
|---|---------------|---|--------|
| 6 | Knowledge     | How is division represented algebraically?        |        |
|   | Application 1 | How do you write $b$ divided by 7 algebraically?  |        |
|   | Application 2 | How do you write 16 divided by $c$ algebraically? |        |

|   |               |   |  |
|---|---------------|---|--|
| 7 | Knowledge     | The symbol for which operation is not written in algebra? |  |
|   | Application 1 | How do you write 8 multiplied by $k$ algebraically?       |  |
|   | Application 2 | How do you write $f$ multiplied by 12 algebraically?      |  |

|   |               |  |  |
|---|---------------|--|--|
| 8 | Knowledge     | How do you share an amount in a ratio? |  |
|   | Application 1 | Share 72 into the ratio 2:7            |  |
|   | Application 2 | Share 192 into the ratio 8:8           |  |

|   |               |  |  |
|---|---------------|--|--|
| 9 | Knowledge     | What is the unitary method?                      |  |
|   | Application 1 | 8 pens cost 96p. Work out the cost of 9 pens.    |  |
|   | Application 2 | 12 pens cost 156p. Work out the cost of 13 pens. |  |

|    |               |   |  |
|----|---------------|---|--|
| 10 | Knowledge     | How do you write a ratio into the form 1:n? |  |
|    | Application 1 | Write the ratio 8:2 into the form 1:n       |  |
|    | Application 2 | Write the ratio 12:10 into the form 1:n     |  |

## Workings Space