

# Year 7 Maths

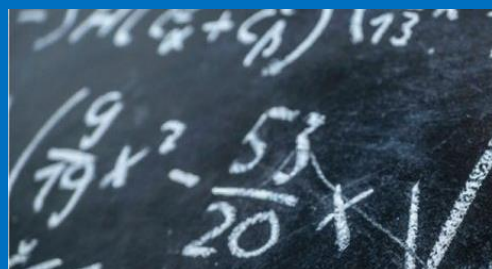
## Knowledge Organiser

### Term 5

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

Keyword	Definition
Polygon	A 2D shape with 3 or more straight connected edges.
Quadrilateral	A 4 sided polygon.
Sum	The result of an addition.
Interior Angle	An angle on the inside of a 2D shape.
Obtuse	An angle more than $90^\circ$ but less than $180^\circ$
Acute	An angle less than $90^\circ$
Reflex	An angle more than $180^\circ$ but less than $360^\circ$
Area	A measure of 2D size.
Perimeter	The length around the outside of a 2D shape.
Compound shape	A shape made by combining other shapes.

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



# Term 5 Overview

## Big Questions for the term

### Lines, angles and shapes

- How do we draw and measure angles?
- What are the basic angle facts?
- What are the properties of different Triangles?
- What are the properties of different Quadrilaterals?
- What is a polygon and what do the interior angles add up to?
- How can I use the sum of interior angles to work out problems?
- How can I work out the missing angle of any polygon?

### Area and Perimeter

- What is perimeter and how do we measure it?
- What mistakes can people make with perimeter?
- What is area?
- How do we work out the area of a triangle?
- How do we work out the area of parallelograms and rhombi?
- How do we work out the area of trapeziums?

## 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.

## Knowledge Retrieval Questions – From Term 4

### Unit 7 – Lines, Angles and Shapes

#	Question	Answer
1	What do the exterior angles of a polygon add up to?	360 degrees
2	What do the angles in a triangle add to?	180 degrees
3	What do the angles in a quadrilateral add up to?	360 degrees
4	What is special about adjacent and opposite angles in a parallelogram?	Adjacent angles sum to 180 degrees, opposite angles are equal.
5	List the types of angles in order of size	Acute, Right, Obtuse, Reflex
6	What do angles which make a straight line sum to?	180 degrees
7	What do angles around a point sum to?	360 degrees
8	How do you work out what the interior angles of a polygon add up to?	Count the sides, subtract 2, multiply by 180.

## Knowledge Retrieval Questions – From Term 5

### Unit 8 – Area and Perimeter

#	Question	Answer
1	State the properties of a square.	4 edges, all equal length, 4 right angles.
2	State the two properties of a trapezium.	Quadrilateral with one pair of parallel edges
3	What is a vertex?	A point where edges meet
4	State the properties of a parallelogram.	Quadrilateral with 2 pairs of parallel edges.
5	What is the formula for calculating the area of a rectangle?	Area = base $\times$ height
6	How do you work out the perimeter of a 2D shape?	Add all the edge lengths
7	What is the formula for calculating the area of a triangle?	$1/2 \times \text{base} \times \text{height}$
8	How do you work out the height of a rectangle if you know the area and the base length?	Area $\div$ Base length
9	What is the formula for calculating the area of a trapezium?	Area = $\frac{1}{2} \times (a+b) \times \text{height}$
10	What is the formula for working out the area of a parallelogram?	Area = base $\times$ height
11	What are the properties of a rectangle?	Quadrilateral with 2 pairs of parallel edges and 4 right angles.
12	What is the formula for working out the area of a square?	Area = base <sup>2</sup>
13	How do you work out the height of a triangle if you know the area and the base length?	$2 \times \text{Area} \div \text{Base length}$

**Term 5 - Homework 1**

#	Type	Question	Answer
1	Knowledge	What sign would the product of 2 negative numbers have?	
	Application 1	What is the product of -3 and -3?	
	Application 2	What is the product of -16 and -8?	

2	Knowledge	How do you convert a decimal to a percentage?	
	Application 1	Convert 0.89 into a percentage.	
	Application 2	Convert 0.139 into a percentage.	

3	Knowledge	How do you convert hours into minutes?	
	Application 1	Convert 3 hours into minutes	
	Application 2	Convert 20 hours into minutes	

4	Knowledge	What does the word product mean?	
	Application 1	What is the product of 8 and 3?	
	Application 2	What is the product of 5 and 16?	

5	Knowledge	How do you convert seconds into minutes?	
	Application 1	Convert 540 seconds into minutes	
	Application 2	Convert 720 seconds into minutes	

#	Type	Question	Answer
6	Knowledge	How do you find an equivalent fraction?	
	Application 1	State a fraction which is equivalent to $\frac{8}{37}$	
	Application 2	State a fraction which is equivalent to $\frac{15}{127}$	

7	Knowledge	In algebra, what does "collecting like terms" mean?	
	Application 1	Simplify the following expression: $10p + 8q - 3p + 3q$	
	Application 2	Simplify the following expression: $20p + 15q - 16p + 20q$	

8	Knowledge	What sign would the product of a positive and a negative number have?	
	Application 1	What is the product of 8 and -3?	
	Application 2	What is the product of 15 and -3?	

9	Knowledge	How do you multiply a number by 10?	
	Application 1	Evaluate 89 multiplied by 10.	
	Application 2	Evaluate 139 multiplied by 10.	

10	Knowledge	How do you write expressions from sentences?	
	Application 1	Write '7 lots of a number plus 3' as an expression.	
	Application 2	Write '19 more than k' as an expression.	



#	Type	Question	Answer
11	Knowledge	What sign would the answer to a negative number divided by a positive number have?	
	Application 1	Calculate -24 divided by 3	
	Application 2	Calculate -300 divided by 20	

12	Knowledge	What does HCF stand for?	
	Application 1	What is the HCF of 40 and 44?	
	Application 2	What is the HCF of 110 and 120?	

13	Knowledge	How do you find the difference between two numbers?	
	Application 1	What is the difference between 37 and 89?	
	Application 2	What is the difference between 127 and 139?	

14	Knowledge	Why do we use BIDMAS?	
	Application 1	Calculate $39 + 8 \times 3$	
	Application 2	Calculate $129 + 11 \times 19$	

15	Knowledge	What does the word sum mean?	
	Application 1	What is the sum of 5 and 6?	
	Application 2	What is the sum of 15 and 20?	

## Workings Space

**Term 5 - Homework 2**

#	Type	Question	Answer
1	Knowledge	What does the word sum mean?	
	Application 1	What is the sum of 9 and 6?	
	Application 2	What is the sum of 17 and 14?	

2	Knowledge	What is adding a negative number equivalent to?	
	Application 1	Evaluate $6 + (-2)$	
	Application 2	Evaluate $14 + (-18)$	

3	Knowledge	In algebra, what is substitution?	
	Application 1	Evaluate $6x + 7y$ , if $x = 2$ and $y = 4$	
	Application 2	Evaluate $14x + 19y$ , if $x = 18$ and $y = 15$	

4	Knowledge	What does HCF stand for?	
	Application 1	What is the HCF of 14 and 16?	
	Application 2	What is the HCF of 40 and 48?	

5	Knowledge	What is the unitary method?	
	Application 1	6 pens cost 84p. Work out the cost of 7 pens.	
	Application 2	14 pens cost 266p. Work out the cost of 15 pens.	

#	Type	Question	Answer
6	Knowledge	How do you convert kilograms into grams?	
	Application 1	Convert 9kg into grams	
	Application 2	Convert 15.1kg into grams	

7	Knowledge	How do you add decimals?	
	Application 1	Calculate $9 + 8.6$	
	Application 2	Calculate $15.1 + 17.3$	

8	Knowledge	How do you convert a mixed number to an improper fraction?	
	Application 1	Convert 9 and $\frac{6}{7}$ into an improper fraction.	
	Application 2	Convert 17 and $\frac{14}{15}$ into an improper fraction.	

9	Knowledge	How do you work out the value of a digit in a long number?	
	Application 1	What is the value of the 2 in the number 31256?	
	Application 2	What is the value of the 2 in the number 52163?	

10	Knowledge	What is a cube number?	
	Application 1	What is 3 cubed?	
	Application 2	What is 6 cubed?	

#	Type	Question	Answer
11	Knowledge	How do you share an amount in a ratio?	
	Application 1	Share 66 into the ratio 7:4	
	Application 2	Share 112 into the ratio 6:2	

12	Knowledge	What is a linear sequence?	
	Application 1	Is the following sequence linear? 5, 7, 9, 11	
	Application 2	Is the following sequence linear? 20, 43, 68, 91	

13	Knowledge	What is subtracting a negative number equivalent to?	
	Application 1	Calculate $9 - (-5)$	
	Application 2	Calculate $17 - (-14)$	

14	Knowledge	How do you simplify a ratio?	
	Application 1	Fully simplify 8:24	
	Application 2	Fully simplify 22:90	

15	Knowledge	How do you convert hours into minutes?	
	Application 1	Convert 2 hours into minutes	
	Application 2	Convert 18 hours into minutes	

## Workings Space

**Term 5 - Homework 3**

#	Type	Question	Answer
1	Knowledge	What is the definition of a factor?	
	Application 1	Give an example of a factor of 6	
	Application 2	Give an example of a factor of 105	

2	Knowledge	How do you convert seconds into minutes?	
	Application 1	Convert 540 seconds into minutes	
	Application 2	Convert 900 seconds into minutes	

3	Knowledge	What should your answer be if the question tells you to evaluate?	
	Application 1	Evaluate $41 + 51$	
	Application 2	Evaluate $118 + 146$	

4	Knowledge	What sign would the product of a positive and a negative number have?	
	Application 1	What is the product of 2 and -7?	
	Application 2	What is the product of 19 and -7?	

5	Knowledge	How do you convert metres to kilometres?	
	Application 1	Convert 7400m into km	
	Application 2	Convert 11700m into km	

#	Type	Question	Answer
6	Knowledge	What is adding a negative number equivalent to?	
	Application 1	Evaluate $2 + (-7)$	
	Application 2	Evaluate $19 + (-14)$	

7	Knowledge	Why do we use BIDMAS?	
	Application 1	Calculate $43 + 5 \times 10$	
	Application 2	Calculate $120 + 19 \times 18$	

8	Knowledge	How do you work out the value of a digit in a long number?	
	Application 1	What is the value of the 4 in the number 53478?	
	Application 2	What is the value of the 1 in the number 41052?	

9	Knowledge	What does consecutive mean?	
	Application 1	Select 2 of these numbers which are consecutive: 2, 7, 3, 10.	
	Application 2	Select 2 of these numbers which are consecutive: 15, 20, 17, 19.	

10	Knowledge	How do you calculate best value?	
	Application 1	SHOW which is better value, Shop A: 10 pens for 70p, or Shop B: 12 pens for 72p	
	Application 2	SHOW which is better value, Shop A: 18 pens for 252p, or Shop B: 20 pens for 300p?	



#	Type	Question	Answer
11	Knowledge	How do you convert kilograms into grams?	
	Application 1	Convert 6.7kg into grams	
	Application 2	Convert 19.4kg into grams	

12	Knowledge	How do you share an amount in a ratio?	
	Application 1	Share 34 into the ratio 7:10	
	Application 2	Share 171 into the ratio 2:7	

13	Knowledge	How do you simplify fractions?	
	Application 1	Fully simplify 12/60	
	Application 2	Fully simplify 80/108	

14	Knowledge	How do you convert a percentage to a decimal?	
	Application 1	Write 67% as a decimal.	
	Application 2	Write 194% as a decimal.	

15	Knowledge	How do you divide a number by 10?	
	Application 1	Calculate 41 divided by 10.	
	Application 2	Calculate 118 divided by 10.	

## Workings Space