

Year 7 Maths

Knowledge Organiser

Term 4

Name:	Class:
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Keyword	Definition
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.
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° but less than 180°
Acute	An angle less than 90°
Reflex	An angle more than 180° but less than 360°

Homework 1 due:	
Homework 2 due:	
Homework 3 due:	



Term 4 Overview

Big Questions for the term

Simplifying and Substitution

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

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?

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	List the types of angles in order of size	Acute, Right, Obtuse, Reflex
3	What do angles which make a straight line sum to?	180 degrees
4	What do angles around a point sum to?	360 degrees
5	How do you work out what the interior angles of a polygon add up to?	Count the sides, subtract 2, multiply by 180.

Term 4 - Homework 1

#	Type	Question	Answer
1	Knowledge	How do you simplify a ratio?	
	Application 1	Fully simplify 6:48	
	Application 2	Fully simplify 40:120	

2	Knowledge	In algebra, what does "collecting like terms" mean?	
	Application 1	Simplify the following expression: $10p + 10q - 10p + 8q$	
	Application 2	Simplify the following expression: $20p + 17q - 18p + 20q$	

3	Knowledge	In algebra, what is substitution?	
	Application 1	Evaluate $10x + 10y$, if $x = 8$ and $y = 8$	
	Application 2	Evaluate $17x + 18y$, if $x = 20$ and $y = 20$	

4	Knowledge	What is the unitary method?	
	Application 1	10 pens cost 170p. Work out the cost of 11 pens.	
	Application 2	17 pens cost 306p. Work out the cost of 18 pens.	

5	Knowledge	How do you share an amount in a ratio?	
	Application 1	Share 180 into the ratio 10:8	
	Application 2	Share 306 into the ratio 10:8	

#	Type	Question	Answer
6	Knowledge	How do you write a ratio into the form 1:n?	
	Application 1	Write the ratio 10:2 into the form 1:n	
	Application 2	Write the ratio 17:10 into the form 1:n	

7	Knowledge	How do you calculate best value?	
	Application 1	SHOW which is better value, Shop A: 8 pens for 64p, or Shop B: 10 pens for 70p	
	Application 2	SHOW which is better value, Shop A: 20 pens for 400p, or Shop B: 22 pens for 462p?	

8	Knowledge	How is division represented algebraically?	
	Application 1	How do you write b divided by 8 algebraically?	
	Application 2	How do you write 20 divided by c algebraically?	

9	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 20 algebraically?	

10	Knowledge	How do you write expressions from sentences?	
	Application 1	Write '3 lots of a number plus 8' as an expression.	
	Application 2	Write '20 less than k' as an expression.	

Workings Space

Term 4 - Homework 2

#	Type	Question	Answer
1	Knowledge	How do you simplify a ratio?	
	Application 1	Fully simplify 14:24	
	Application 2	Fully simplify 40:90	

2	Knowledge	What do angles around a point sum to?	
	Application 1	If four angles surround a point and three of them are 146, 54 and 36. What is the fourth?	
	Application 2	If four angles surround a point and three of them are 184, 87 and 24. What is the fourth?	

3	Knowledge	How is division represented algebraically?	
	Application 1	How do you write b divided by 4 algebraically?	
	Application 2	How do you write 15 divided by c algebraically?	

4	Knowledge	The symbol for which operation is not written in algebra?	
	Application 1	How do you write 9 multiplied by k algebraically?	
	Application 2	How do you write f multiplied by 14 algebraically?	

5	Knowledge	How do you work out what the interior angles of a polygon add up to?	
	Application 1	What is the sum of the interior angles of a polygon with 6 sides?	
	Application 2	What is the sum of the interior angles of a polygon with 10 sides?	

#	Type	Question	Answer
6	Knowledge	How do you write expressions from sentences?	
	Application 1	Write '7 lots of a number minus 4' as an expression.	
	Application 2	Write '20 less than k' as an expression.	

7	Knowledge	What do the exterior angles of a polygon add up to?	
	Application 1	What are each of the exterior angles in a 5-sided shape?	
	Application 2	What are each of the exterior angles in a 11-sided shape?	

8	Knowledge	How do you share an amount in a ratio?	
	Application 1	Share 80 into the ratio 6:4	
	Application 2	Share 289 into the ratio 8:9	

9	Knowledge	List the types of angles in order of size	
	Application 1	What type is an angle which measures 162 degrees?	
	Application 2	What type is an angle which measures 252 degrees?	

10	Knowledge	In algebra, what does "collecting like terms" mean?	
	Application 1	Simplify the following expression: $10p + 8q - 6p + 9q$	
	Application 2	Simplify the following expression: $20p + 17q - 17p + 14q$	

#	Type	Question	Answer
11	Knowledge	In algebra, what is substitution?	
	Application 1	Evaluate $8x + 6y$, if $x = 9$ and $y = 4$	
	Application 2	Evaluate $17x + 17y$, if $x = 14$ and $y = 15$	

12	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 17:10 into the form 1:n	

13	Knowledge	What is the unitary method?	
	Application 1	8 pens cost 136p. Work out the cost of 9 pens.	
	Application 2	17 pens cost 289p. Work out the cost of 18 pens.	

14	Knowledge	What do angles which make a straight line sum to?	
	Application 1	If three angles make a straight line and two of them are 40 and 15. What is the third angle?	
	Application 2	If three angles make a straight line and two of them are 80 and 30. What is the third angle?	

15	Knowledge	How do you calculate best value?	
	Application 1	SHOW which is better value, Shop A: 4 pens for 36p, or Shop B: 6 pens for 48p	
	Application 2	SHOW which is better value, Shop A: 15 pens for 210p, or Shop B: 17 pens for 255p?	

Workings Space

Term 4 - Homework 3

#	Type	Question	Answer
1	Knowledge	How do you write expressions from sentences?	
	Application 1	Write '2 lots of a number subtract 2' as an expression.	
	Application 2	Write '19 less than k' as an expression.	

2	Knowledge	What is the unitary method?	
	Application 1	8 pens cost 96p. Work out the cost of 9 pens.	
	Application 2	12 pens cost 132p. Work out the cost of 13 pens.	

3	Knowledge	How do you share an amount in a ratio?	
	Application 1	Share 64 into the ratio 6:2	
	Application 2	Share 120 into the ratio 8:2	

4	Knowledge	How do you work out what the interior angles of a polygon add up to?	
	Application 1	What is the sum of the interior angles of a polygon with 7 sides?	
	Application 2	What is the sum of the interior angles of a polygon with 8 sides?	

5	Knowledge	What do angles around a point sum to?	
	Application 1	If four angles surround a point and three of them are 184, 99 and 36. What is the fourth?	
	Application 2	If four angles surround a point and three of them are 132, 39 and 12. What is the fourth?	

#	Type	Question	Answer
6	Knowledge	What do angles which make a straight line sum to?	
	Application 1	If three angles make a straight line and two of them are 10 and 45. What is the third angle?	
	Application 2	If three angles make a straight line and two of them are 80 and 30. What is the third angle?	

7	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	

8	Knowledge	List the types of angles in order of size	
	Application 1	What type is an angle which measures 297 degrees?	
	Application 2	What type is an angle which measures 96 degrees?	

9	Knowledge	How is division represented algebraically?	
	Application 1	How do you write b divided by 2 algebraically?	
	Application 2	How do you write 13 divided by c algebraically?	

10	Knowledge	In algebra, what is substitution?	
	Application 1	Evaluate $8x + 6y$, if $x = 2$ and $y = 2$	
	Application 2	Evaluate $12x + 11y$, if $x = 17$ and $y = 13$	

#	Type	Question	Answer
11	Knowledge	What do the exterior angles of a polygon add up to?	
	Application 1	What are each of the exterior angles in a 7-sided shape?	
	Application 2	What are each of the exterior angles in a 10-sided shape?	

12	Knowledge	The symbol for which operation is not written in algebra?	
	Application 1	How do you write 2 multiplied by k algebraically?	
	Application 2	How do you write f multiplied by 17 algebraically?	

13	Knowledge	How do you calculate best value?	
	Application 1	SHOW which is better value, Shop A: 2 pens for 4p, or Shop B: 4 pens for 4p	
	Application 2	SHOW which is better value, Shop A: 13 pens for 221p, or Shop B: 15 pens for 270p?	

14	Knowledge	In algebra, what does "collecting like terms" mean?	
	Application 1	Simplify the following expression: $10p + 8q - 6p + 2q$	
	Application 2	Simplify the following expression: $20p + 12q - 11p + 17q$	

15	Knowledge	How do you simplify a ratio?	
	Application 1	Fully simplify 4:12	
	Application 2	Fully simplify 38:78	

Workings Space