

Year 9 Foundation Maths

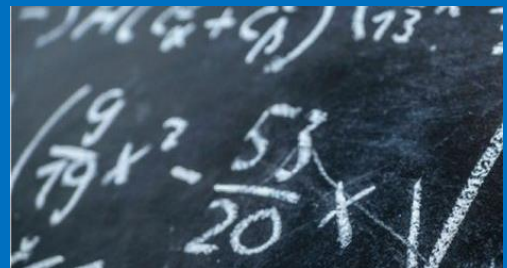
Knowledge Organiser

Term 2

Name:	Class:
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Keyword	Definition
Ratio	Shows the relative sizes of two or more values.
Proportion	The relationship compared to the whole.
Equivalent	Equal to the same amount.
Simplifying	With fractions and ratio, simplifying is finding the equivalent fraction or ratio with the smallest numbers.
Direct Proportion	A relationship between 2 variables, the ratio between them is always constant.
Numerator	The top number in a fraction.
Denominator	The bottom number in a fraction.
Improper Fraction	A fraction where the numerator is not smaller than the denominator.
Mixed Number	A combination of a whole number and a fraction.
Product	The result of multiplication.
Percent	Out of 100
Simplify	To make simpler or easier to understand by reducing the size of numbers or the number of terms.
Reciprocal	The result of dividing 1 by the number.

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



Term 2 Overview

Big Questions for the term

Ratio and proportion

- What are the different types of ratio questions?
- What is unitary ratio?
- What is direct proportion?
- What is inverse proportion?
- What does it mean for shapes to be similar?
- How do we convert measures for area and volume?

Fractions, decimals and percentages

- How do we represent fractions?
- How do we perform operations with fractions?
- How do we convert between fractions, decimals and percentages?
- How do we work out fractions of amounts?
- How do we work out percentages of amounts?
- What is a decimal multiplier?
- How do we work out percentage change?

Knowledge Retrieval Questions – From Year 7

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)
13	What is the definition of a prime number?	A number with only 2 factors.

Unit 3 – 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 n:1?	Divide both numbers in the ratio by the second 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 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 Year 8

Unit 2 – Integers, Powers and Roots

#	Question	Answer
1	How do you estimate a square root?	Identify the square numbers either side of it
2	How do you simplify the product of two powers with the same base?	Add the indices together
3	How do you simplify the division of two powers with the same base?	Subtract the second index from the first
4	What is the answer to any number raised to the power zero?	1
5	How do you simplify a power raised to another power?	Multiply the indices together
6	How is a negative index related to the same positive index?	The negative index is the reciprocal of the positive one
7	How do you determine the index when converting large numbers into standard form?	It is the number of digits after the first non-zero digit
8	How do you determine the index when converting small numbers into standard form?	It is the number of digits before the first non-zero digit
9	The first part of a number written in standard form should be between which 2 numbers?	1 and 10 (smaller than 10...)

Unit 3 – Ratio and proportion

None.

Unit 4 – Fractions, decimals and percentages

#	Question	Answer
1	With a calculator, how do you convert a decimal to a percentage?	Multiply by 100 (%)
2	With a calculator, how do you convert a decimal to a fraction?	Type the decimal in and press =
3	With a calculator, how do you convert a fraction to a percentage?	Multiply by 100 (%) and press S <=> D
4	With a calculator, how do you convert a fraction to a decimal?	Type the fraction in and press =, followed by S <=> D
5	With a calculator, how do you convert a percentage to a decimal?	Type the percentage in and press =, followed by S <=> D
6	With a calculator, how do you convert a percentage to a fraction?	Type the percentage in and press =

Knowledge Retrieval Questions – For Year 9

Unit 2 – Integers, Powers and Roots

#	Question	Answer
1	How do you simplify the product of two powers with the same base?	Keep the base the same and add the indices.
2	How do you simplify the division of two powers with the same base?	Keep the base the same and subtract the second index from the first.
3	How do you multiply numbers in standard form?	Multiply the numbers, add the indices, adjust if necessary
4	How do you divide numbers in standard form?	Divide the numbers, subtract the indices, adjust if necessary

Unit 3 – Ratio and proportion

#	Question	Answer
1	How do you share in a ratio if you are given the difference?	Work out the difference in the ratio and scale up to the difference you want
2	How do you share in a ratio if you are given one of the final amounts?	Scale up from the ratio to the amount you know and apply to the other
3	How do you use exchange rates to convert money?	Scale up the currency you know and apply to the other
4	What is direct proportion?	Describes quantities which have a constant ratio
5	What is indirect proportion?	Describes quantities which have a constant product
6	What is a scale factor?	The ratio between corresponding measurements of similar shapes

Unit 4 – Fractions, decimals and percentages

#	Question	Answer
1	How do you find 30% of an amount without a calculator?	Find 10% by dividing the amount by 10, then multiply by 3.
2	How do you increase an amount by 40% without a calculator?	Find 10% by dividing by 10, multiply that by 4, then add the result onto the original amount.
3	How do you increase an amount by a percentage?	Calculate the percentage of the amount, then add it on to the original amount
4	How do you decrease an amount by a percentage?	Calculate the percentage of the amount, then subtract it from the original amount
5	With a calculator, how do you increase an amount by a percentage?	Add the percentage to 100%, then multiply by the amount
6	With a calculator, how do you decrease an amount by a percentage?	Subtract the percentage from 100%, then multiply by the amount
7	$\text{amount} + \% \text{ of amount} \times \text{number of years}$	
8	How do you work out percentage change?	$(\text{Change} \div \text{Original}) \times 100 (\%)$
9	What does it mean to work out a reverse percentage?	You are given the amount AFTER a percentage has been applied and asked to work out the original amount

Term 2 - Homework 1

#	Type	Question	Answer
1	Knowledge	How do you determine the index when converting large numbers into standard form?	
	Application 1	What is the index when the number 493000000 is written in standard form?	
	Application 2	What is the index when the number 839000 is written in standard form?	

2	Knowledge	What sign would the product of a positive and a negative number have?	
	Application 1	What is the product of 9 and -4?	
	Application 2	What is the product of 5 and -4?	

3	Knowledge	How do you multiply numbers in standard form?	
	Application 1	Calculate, giving your answer in standard form, $(8 \times 10^0) \times (2 \times 10^{-5})$	
	Application 2	Calculate, giving your answer in standard form, $(2 \times 10^{-9}) \times (2 \times 10^2)$	

4	Knowledge	What is a cube number?	
	Application 1	What is 5 cubed?	
	Application 2	What is 6 cubed?	

5	Knowledge	List the first 15 square numbers.	
	Application 1	What is the 9th square number?	
	Application 2	What is the 18th square number?	

#	Type	Question	Answer
6	Knowledge	How do you determine the index when converting small numbers into standard form?	
	Application 1	What is the index when the number 0.00000549 is written in standard form?	
	Application 2	What is the index when the number 0.0039 is written in standard form?	

7	Knowledge	What is the definition of a factor?	
	Application 1	Give an example of a factor of 9	
	Application 2	Give an example of a factor of 35	

8	Knowledge	What is the definition of a multiple?	
	Application 1	Give an example of a multiple of 7	
	Application 2	Give an example of a multiple of 3	

9	Knowledge	Why do we use BIDMAS?	
	Application 1	Calculate $70 + 4 \times 8$	
	Application 2	Calculate $168 + 7 \times 5$	

10	Knowledge	What sign would the answer to a negative number divided by a positive number have?	
	Application 1	Calculate -36 divided by 4	
	Application 2	Calculate -25 divided by 5	

#	Type	Question	Answer
11	Knowledge	What is the definition of a square number?	
	Application 1	What is the 5th square number?	
	Application 2	What is the 16th square number?	

12	Knowledge	How do you estimate a square root?	
	Application 1	Between which two integers is the square root of 136?	
	Application 2	Between which two integers is the square root of 58?	

13	Knowledge	What does LCM stand for?	
	Application 1	What is the LCM of 8 and 5?	
	Application 2	What is the LCM of 10 and 8?	

14	Knowledge	What does HCF stand for?	
	Application 1	What is the HCF of 48 and 40?	
	Application 2	What is the HCF of 115 and 115?	

15	Knowledge	What is the answer to any number raised to the power zero?	
	Application 1	Evaluate 13^0	
	Application 2	Evaluate 11^0	

Workings Space

Term 2 - Homework 2

#	Type	Question	Answer
1	Knowledge	How do you share an amount in a ratio?	
	Application 1	Share 90 into the ratio 5:5	
	Application 2	Share 64 into the ratio 9:7	

2	Knowledge	How do you share in a ratio if you are given the difference?	
	Application 1	Anna and Ben share money in the ratio 5:2. Anna gets £420 more than Ben, how much does Anna get?	
	Application 2	Anna and Ben share money in the ratio 7:2. Anna gets £250 more than Ben, how much does Anna get?	

3	Knowledge	What is a scale factor?	
	Application 1	Corresponding sides on two similar shapes are 8cm and 28cm. What is the scale factor?	
	Application 2	Corresponding sides on two similar shapes are 6cm and 9cm. What is the scale factor?	

4	Knowledge	What is the unitary method?	
	Application 1	9 pens cost 36p. Work out the cost of 10 pens.	
	Application 2	4 pens cost 16p. Work out the cost of 5 pens.	

5	Knowledge	What is direct proportion?	
	Application 1	x and y are in direct proportion. When $x = 5$ $y = 15$. What would y be if $x = 13$?	
	Application 2	x and y are in direct proportion. When $x = 10$ $y = 30$. What would x be if $y = 39$?	

#	Type	Question	Answer
6	Knowledge	How do you calculate best value?	
	Application 1	SHOW which is better value, Shop A: 5 pens for 35p, or Shop B: 7 pens for 42p	
	Application 2	SHOW which is better value, Shop A: 3 pens for 9p, or Shop B: 5 pens for 20p?	

7	Knowledge	How do you simplify a ratio?	
	Application 1	Fully simplify 6:30	
	Application 2	Fully simplify 8:18	

8	Knowledge	What is indirect proportion?	
	Application 1	x and y are in indirect proportion. When $x = 60$ $y = 60$. What would x be if $y = 36$?	
	Application 2	x and y are in indirect proportion. When $x = 20$ $y = 40$. What would x be if $y = 20$?	

9	Knowledge	How do you write a ratio into the form n:1?	
	Application 1	Write the ratio 9:2 into the form n:1	
	Application 2	Write the ratio 4:10 into the form n:1	

10	Knowledge	How do you use exchange rates to convert money?	
	Application 1	The exchange rate for GBP to USD is 1:1.26. How many Dollars would get for £370?	
	Application 2	The exchange rate for GBP to USD is 1:1.29. How many Dollars would get for £480?	

Workings Space

Term 2 - Homework 3

#	Type	Question	Answer
1	Knowledge	How do you find an equivalent fraction?	
	Application 1	State a fraction which is equivalent to $\frac{5}{91}$	
	Application 2	State a fraction which is equivalent to $\frac{3}{111}$	

2	Knowledge	With a calculator, how do you convert a percentage to a fraction?	
	Application 1	Convert 40% into a fraction.	
	Application 2	Convert 33% into a fraction.	

3	Knowledge	How do you convert a mixed number to an improper fraction?	
	Application 1	Convert 1 and $\frac{5}{6}$ into an improper fraction.	
	Application 2	Convert 4 and $\frac{3}{4}$ into an improper fraction.	

4	Knowledge	What does percent mean?	
	Application 1	Write 29% as a fraction.	
	Application 2	Write 182% as a fraction.	

5	Knowledge	What's the first step when adding or subtracting fractions?	
	Application 1	Complete the first step of the calculation $\frac{1}{8} + \frac{7}{4}$	
	Application 2	Complete the first step of the calculation $\frac{4}{15} + \frac{3}{10}$	

#	Type	Question	Answer
6	Knowledge	How do you convert a fraction to a decimal if the denominator is a factor of 100?	
	Application 1	What is $\frac{7}{25}$ as a decimal?	
	Application 2	What is $\frac{2}{100}$ as a decimal?	

7	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 2 sixths?	

8	Knowledge	How do you work out the value after adding simple interest?	
	Application 1	Calculate the balance if an account with £5300 got 3% simple interest for 3 years.	
	Application 2	Calculate the balance if an account with £2600 got 2% simple interest for 4 years.	

9	Knowledge	How do you find a fraction of an amount?	
	Application 1	Find $\frac{9}{11}$ of 88	
	Application 2	Find $\frac{8}{11}$ of 44	

10	Knowledge	How do you work out percentage change?	
	Application 1	Over a year, your bank account goes from £7000 to £10200, calculate the percentage change.	
	Application 2	Over a year, your bank account goes from £7000 to £8500, calculate the percentage change.	

#	Type	Question	Answer
11	Knowledge	How do you increase an amount by 40% without a calculator?	
	Application 1	Increase 160 by 40%	
	Application 2	Increase 280 by 40%	

12	Knowledge	With a calculator, how do you convert a percentage to a decimal?	
	Application 1	Convert 85% into a decimal.	
	Application 2	Convert 89% into a decimal.	

13	Knowledge	With a calculator, how do you increase an amount by a percentage?	
	Application 1	Increase 109 by 14%	
	Application 2	Increase 76 by 5%	

14	Knowledge	How do you multiply fractions?	
	Application 1	Calculate $\frac{7}{80} \times \frac{8}{40}$	
	Application 2	Calculate $\frac{3}{40} \times \frac{5}{80}$	

15	Knowledge	Which operation do we use for the word 'of'?	
	Application 1	Write the calculation for 'Two thirds of 30'	
	Application 2	Write the calculation for 'Seven twelfths of 36'	

Workings Space