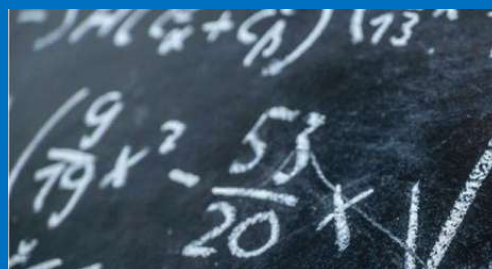


# Year 9 Foundation Maths Knowledge Organiser Term 4

<b>Name:</b>	<b>Class:</b>
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Keyword	Definition
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.
Equation	An expression which is equal to another expression.
Elimination	In solving equations, elimination refers to removing something from one side of the equation by doing the same operation to both sides.
Unknown	In algebra, an unknown is a letter which represents a value we don't know.
Subject	The subject of an equation is the letter on its own on one side of the equation.

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





## RESPECT

In Mathematics, a classroom environment should always be respectful. Students can show respect through:

- **Supporting each other with their learning.** Pupils should recognise that every individual has their own strengths and weaknesses and, as a class, we should 'up-lift' students.
- **Students should not be felt to be rushed by others in the classroom.** Respect that all students have different experiences and therefore will access the knowledge at different rates.
- **Being Polite.** As no different to the rest of school. Students should embrace diversity and treat all others with tolerance and decency.



## ASPIRATION

- **Building logical processes.** Understanding that learning mathematical concepts improves our logical reasoning which improves other aspects of our lives: language, culture, games etc. the essence of mathematics is in respect of ideas, structures and relationships by logical reasoning.
- **Every day needs.** Understanding that being numerate, along with literate, is a strong indicator of long-term success and students' ability to climb the tree of knowledge.



## RESILIENCE

- **I don't know it... yet.** Understanding that maths can be abstract and that, as with anything new, it will take time to learn. With time, you will succeed.
- **Mathematical concept won't always come easily.** Understanding that getting things wrong is a frustrating and not pleasant feeling but, to succeed, it is a passage we need to go through.
- **Practice makes permanent.** Mathematics is a logical subject such that, rehearsal and repetition of method is the key to being successful and committing the knowledge to long-term memory. This process takes time and will come with failures along the way which we must persevere through.

# Term 4 Overview

## Big Questions for the term

### Forming and solving equations

- What did we learn in Year 8?
- How do we re-arrange equations?
- How do we solve simultaneous equation?

### Sequences, functions and graphs

- What have we learnt so far?
- How can we work out the equation of a straight line?
- What does a quadratic look like?

## Knowledge Retrieval Questions – From Year 8

### Unit 7 – Forming and solving equations

#	Question	Answer
1	How do you solve an equation with an unknown on one side?	Undo each of the parts of the equation, in reverse BIDMAS order.
2	How do you solve an equation with an unknown on both sides?	Simplify, by subtracting the smaller of the two terms containing the unknown, then proceed as normal.
3	What does it mean to "solve an equation"?	Find the value or values of the unknown which make the equation correct.
4	What do you do if you have brackets in your equations?	If you only have one letter, proceed as normal. If you have more than one letter, expand and simplify, then proceed as normal.
5	How do you rearrange an equation so that x is the subject?	Treat it as if you were solving for x, but your answer will be algebraic.
6	What does it mean to "form an equation"?	Write the sentence as an equation, you may need to remember a formula first.

### Unit 8 – Sequences, functions and graphs

#	Question	Answer
1	How do you find the nth term of a linear sequence?	Identify the term-to-term rule, then work out what you have to add/subtract to get to the first term.
2	How do you work out the equation of a horizontal or vertical line?	Identify the number where the line goes through the axis, a. If horizontal: $y = a$ . If vertical: $x = a$ .
3	How do you find the value of any term using the nth term rule?	Substitute the number of the term into the nth term rule.
4	How do you work out the gradient of a line?	Choose 2 points on the line, then divide the change in y by the change in x.
5	What do the letters m and c represent in $y = mx + c$ ?	$m = \text{gradient}$ , $c = \text{y-intercept}$
6	How do you find the equation of a line given two points on it?	Find the gradient. Substitute the gradient and the (x,y) of one of the points into $y = mx + c$ and solve for c.
7	How do you know, given the equations of two lines, if they are parallel?	They have the same gradient.
8	How do you find the midpoint given two points?	The midpoint will have coordinates halfway between the x and y coordinates of the two given points.

## Knowledge Retrieval Questions – For Year 9

### Unit 7 – Forming and solving equations

#	Question	Answer
1	What is the first step for solving simultaneous equations where one of the equations has one unknown?	Solve the equation with a single unknown.

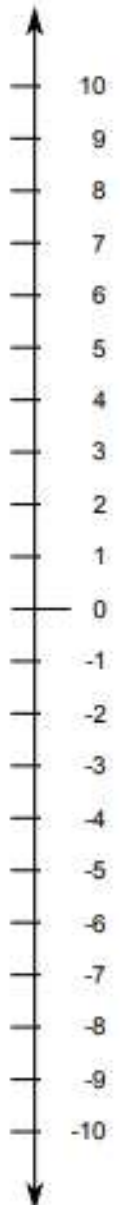
### Unit 8 – Sequences, functions and graphs

#	Question	Answer
1	How do you plot a quadratic graph?	Substitute x values (often -3, -2, -2, 0, 1, 2, 3) into the equation to find y values, then plot those coordinates.

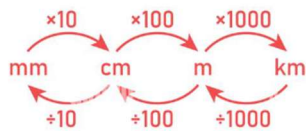
## Multiplication Chart

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

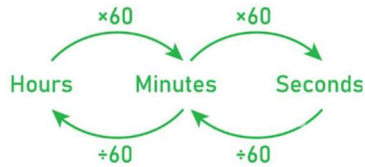
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	.	tenths	hundredths	thousandths	ten thousandths	hundred thousandths
HTH	TTh	Th	H	T	0	.	t	h	th	tth	hth
100,000	10,000	1,000	100	10	1	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1,000}$	$\frac{1}{10,000}$	$\frac{1}{100,000}$
Whole Number Part						Decimal Point	Fractional Part				



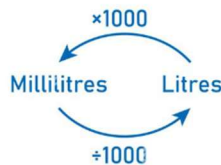
### Length



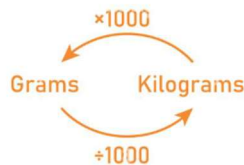
### Time



### Volume



### Mass



## Remote-Learning

If you are absent from school, lesson work can be found on your year group Teams channel: files -> class materials -> maths

This website is useful to students as it contains videos to support students understanding and also extra questions to extend and support students.

Please see your class teacher for any login issues

[vle.mathswatch.co.uk](http://vle.mathswatch.co.uk)

Username: firstnamesurname@dustonschool

Password: berrywood

**Term 4 - Homework 1**

#	Type	Question	Answer
1	Knowledge	How do you expand single brackets?	Multiply the term outside the brackets by each of the terms inside
	Application 1	Expand $4(7v + 3)$	
	Application 2	Expand $6(7t + 9)$	

2	Knowledge	What is the first step in factorising into single brackets?	Find the highest common factor of the terms.
	Application 1	What is the highest common factor of 4 and 16?	
	Application 2	What is the highest common factor of $4x$ and $16x$ ?	

3	Knowledge	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 before the decimal point
	Application 1	What is the index when the number 493 000 000 is written in standard form?	
	Application 2	What is the index when the number 839 000 is written in standard form?	

4	Knowledge	What sign would the product of a positive and a negative number have?	Negative
	Application 1	What is the product of 9 and $-7$ ?	
	Application 2	What is the product of 5 and $-2$ ?	

5	Knowledge	What is a scale factor?	The ratio between corresponding measurements of similar shapes
	Application 1	Corresponding sides on two similar shapes are 7cm and 14cm. What is the scale factor?	
	Application 2	Corresponding sides on two similar shapes are 11cm and 22cm. What is the scale factor?	

6	Knowledge	The symbol for which operation is not written in algebra?	Multiplication
	Application 1	Write $p$ multiplied by 6 in algebraic form	
	Application 2	Write $g$ multiplied by $r$ in algebraic form	

7	Knowledge	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
	Application 1	Anna and Ben share money in the ratio 3:1. Anna gets £160 more than Ben, how much does Anna get?	
	Application 2	Anna and Ben share money in the ratio 3:2. Anna gets £160 more than Ben, how much does Anna get?	

8	Knowledge	How do you expand double brackets?	Multiply each of the terms in the first bracket by each of the terms in the second bracket
	Application 1	Expand $(t + 2)(t + 8)$	
	Application 2	Expand $(u + 3)(u + 8)$	

9	Knowledge	When are brackets used in an expression?	When the order of operations is different to BIDMAS order.
	Application 1	Write this as an expression: x subtracts q all multiplied by b	
	Application 2	Write this as an expression: y adds r all multiplied by c	

10	Knowledge	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
	Application 1	Carly and Dan share money in the ratio 5:1. Dan gets £140, how much does Carly get?	
	Application 2	Carly and Dan share money in the ratio 5:2. Dan gets £200, how much does Carly get?	

11	Knowledge	How do you convert a decimal to a percentage?	Multiply by 100 (%)
	Application 1	Convert 0.72 to a percentage.	
	Application 2	Convert 0.125 to a percentage.	

12	Knowledge	How is division represented algebraically	As a fraction
	Application 1	Write a divided by 6 in algebraic form	
	Application 2	Write (x+4) divided by (x+3) in algebraic form	

**Term 4 - Homework 2**

#	Type	Question	Answer
1	Knowledge	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.
	Application 1	Increase 160 by 40%	
	Application 2	Increase 160 by 40%	

2	Knowledge	How do you convert a mixed number to an improper fraction?	Multiply the whole number by the denominator and add it to the numerator
	Application 1	Convert $1\frac{3}{7}$ into an improper fraction.	
	Application 2	Convert $1\frac{4}{5}$ into an improper fraction.	

3	Knowledge	When are brackets used in an expression?	When the order of operations is different to BIDMAS order
	Application 1	Write this as an expression: x subtracts p all multiplied by c	
	Application 2	Write this as an expression: w adds r all multiplied by b	

4	Knowledge	With a calculator, how do you increase an amount by a percentage?	Add the percentage to 100%, then multiply by the amount
	Application 1	Increase 101 by 29%	
	Application 2	Increase 79 by 26%	

5	Knowledge	With a calculator, how do you convert a decimal to a fraction?	Type the decimal in and press =
	Application 1	Convert 0.31 into a fraction.	
	Application 2	Convert 0.02 into a fraction.	

6	Knowledge	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
	Application 1	Carly and Dan share money in the ratio 5:1. Dan gets £80, how much does Carly get?	
	Application 2	Carly and Dan share money in the ratio 7:4. Dan gets £280, how much does Carly get?	

7	Knowledge	How do you work out the value after adding simple interest?	amount + % of amount × number of years
	Application 1	Calculate the balance if an account with £4100 got 6% simple interest for 2 years.	Value of 6% → Value of interest after 2 years → Value in the account after 2 years
	Application 2	Calculate the balance if an account with £9100 got 2% simple interest for 5 years.	Value of 2% → Value of interest after 5 years → Value in the account after 5 years →

8	Knowledge	With a calculator, how do you convert a decimal to a percentage?	Multiply by 100 (%)
	Application 1	Convert 0.81 into a percentage.	
	Application 2	Convert 0.78 into a percentage.	

9	Knowledge	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
	Application 1	What is the index when the number 0.00 789 is written in standard form?	
	Application 2	What is the index when the number 0.000 8 is written in standard form?	

10	Knowledge	What is direct proportion?	Describes quantities which have a constant ratio
	Application 1	x and y are in direct proportion. When $x = 4$ $y = 20$ . What would y be if $x = 15$ ?	
	Application 2	x and y are in direct proportion. When $x = 10$ $y = 20$ . What would y be if $x = 13$ ?	

11	Knowledge	How do you expand single brackets?	Multiply the term outside the brackets by each of the terms inside
	Application 1	Expand $3(3w + 5)$	
	Application 2	Expand $6(2v + 3)$	

12	Knowledge	What is the first step in factorising into single brackets?	Find the highest common factor of the terms.
	Application 1	What is the highest common factor of $y^3$ and $10y^3$ ?	
	Application 2	What is the highest common factor of $3x^3$ and $9y^3$ ?	

13	Knowledge	How do you find 30% of an amount without a calculator?	Find 10% by dividing the amount by 10, then multiply by 3.
	Application 1	Find 30% of 70	
	Application 2	Find 30% of 40	

14	Knowledge	With a calculator, how do you decrease an amount by a percentage?	Subtract the percentage from 100%, then multiply by the amount
	Application 1	Decrease 67 by 20%	
	Application 2	Decrease 58 by 10%	

### Term 4 - Homework 3

#	Type	Question	Answer
1	Knowledge	How do you solve an equation with an unknown on one side?	Undo each of the parts of the equation, in reverse BIDMAS order.
	Application 1	Solve $4b - 4 = 4$	
	Application 2	Solve $6b + 3 = 15$	

2	Knowledge	With a calculator, how do you convert a decimal to a fraction?	Type in the decimal, press exe and then format. Select fraction.
	Application 1	Convert 0.61 into a fraction.	
	Application 2	Convert 0.69 into a fraction.	

3	Knowledge	With a calculator, how do you decrease an amount by a percentage?	Subtract the percentage from 100%, then multiply by the amount
	Application 1	Decrease 57 by 20%	
	Application 2	Decrease 83 by 33%	

4	Knowledge	How do you work out the value after adding simple interest?	amount + % of amount × number of years
	Application 1	Calculate the balance if an account with £9600 got 5% simple interest for 5 years.	Value of 5% → Value of interest after 5 years → Value in the account after 5 years
	Application 2	Calculate the balance if an account with £3000 got 5% simple interest for 3 years.	Value of 5% → Value of interest after 3 years → Value in the account after 3 years →

5	Knowledge	What does the word sum mean?	The result of addition.
	Application 1	What is the sum of 3 and 3?	
	Application 2	What is the sum of 17 and 16?	

6	Knowledge	With a calculator, how do you convert a decimal to a percentage?	Multiply by 100 (%)
	Application 1	Convert 0.93 into a percentage.	
	Application 2	Convert 0.85 into a percentage.	

7	Knowledge	How do you work out percentage change?	$(\text{Change} \div \text{Original}) \times 100 (\%)$
	Application 1	Over a year, your bank account goes from £7000 to £8500, calculate the percentage change.	$\text{————} \times 100 =$
	Application 2	Over a year, your bank account goes from £9800 to £10200, calculate the percentage change.	$\text{————} \times 100 =$

8	Knowledge	With a calculator, how do you convert a fraction to a decimal?	Type the fraction in and press exe, press format and select decimal
	Application 1	Convert 13/50 into a decimal.	
	Application 2	Convert 27/50 into a decimal.	

9	Knowledge	What is a linear sequence?	A number pattern which increases or decreases by the same amount each time.
	Application 1	Is the following sequence linear? 1, 3, 8, 10	
	Application 2	Is the following sequence linear? 21, 41, 62, 82	

<b>10</b>	Knowledge	How do you increase an amount by a percentage?	Calculate the percentage of the amount, then add it on to the original amount
	Application 1	Increase 80 by 5%	
	Application 2	Increase 50 by 15%	

<b>11</b>	Knowledge	What should your answer be if the question tells you to evaluate?	A number
	Application 1	Evaluate $16 + 46$	
	Application 2	Evaluate $142 + 122$	

<b>12</b>	Knowledge	How do you find 30% of an amount without a calculator?	Find 10% by dividing the amount by 10, then multiply by 3.
	Application 1	Find 30% of 80	
	Application 2	Find 30% of 70	

<b>13</b>	Knowledge	What is the unitary method?	A method where the first step is making the ratio 1: n or n:1
	Application 1	10 pens cost 40p. Work out the cost of 5 pens.	
	Application 2	8 pens cost 16p. Work out the cost of 4 pens.	

<b>14</b>	Knowledge	With a calculator, how do you convert a percentage to a decimal?	Type the percentage in and press exe, then format and select decimal
	Application 1	Convert 22% into a decimal.	
	Application 2	Convert 34% into a decimal.	



# Estate Agent

*Estate agents coordinate the selling and renting of properties.*

Your day-to-day tasks can include:

- valuing properties for sellers and landlords
- managing sales and lettings
- booking property viewings for clients looking to buy or rent
- showing clients properties, asking for their feedback, and using this feedback to recommend different properties or get the process started for buying/renting
- facilitating negotiation between buyers and sellers
- administrative tasks like updating records, sending emails, and making calls

## Working Hours and Environment

You'll usually work 35-40 hours a week, Monday to Friday. You may work on weekends too.

You could also become self-employed as a partner in a firm or set up your own agency.

## Entry Requirements

There are no formal entry requirements, but experience in customer service and a good knowledge of the local property market is beneficial.

You may be able to start as an administrator in an estate or lettings agency.

## Skills Required:

You'll need:

- organisation / time management
- communication
- numeracy skills
- attention to detail / observation
- learning / knowledge

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