



Year 11

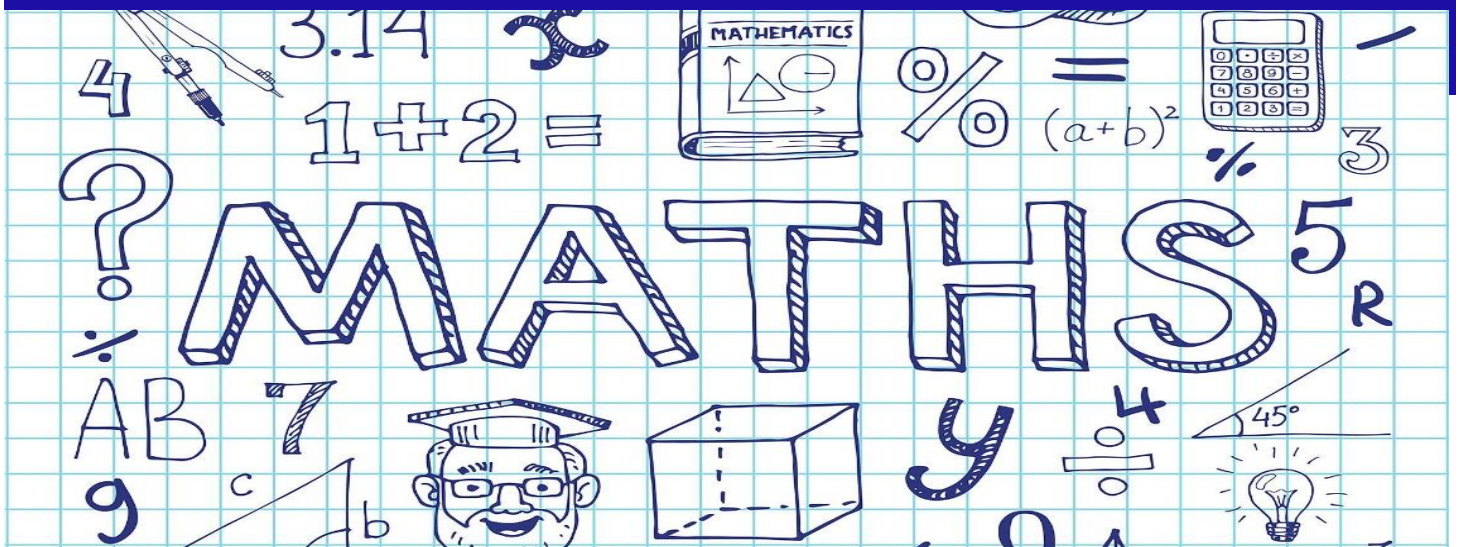
Additional Maths

Term 4

Name: _____

Class: _____

Teacher: _____



Additional Online Homework:

Platform	Due:

Log-in details:



Website: <https://vle.mathswatch.co.uk/vle/>

Username: (firstname)(lastname)@dustonschool

Password: berrywood



Website: <https://www.methodmaths.com/login.html>

Centre ID: duston

Username: (firstname)(lastname)

Password: berrywood



Grade 1

Place Value	1
Ordering Integers	2
Ordering Decimals	3
Reading Scales	4
Simple Mathematical Notation	5
Interpreting Real-Life Tables	6
Introduction to Algebraic Conventions	7
Coordinates	8
Simple Geometric Definitions	9
Polygons	10
Symmetries	11
Tessellations and Congruent Shapes	12
Names of Angles	13
The Probability Scale	14
Tally Charts and Bar Charts	15
Pictograms	16

Addition/Subtraction

$(+) \times (+)$ becomes +	eg. $5 - (-3) = 5 + 3$
$(-) \times (-)$ becomes +	
$(+) \times (-)$ becomes -	eg. $5 + (-3) = 5 - 3$
$(-) \times (+)$ becomes -	

Multiplication/Division

$(+) \times (+)$ becomes +	eg. $(-5) \times (-3) = 15$
$(-) \times (-)$ becomes +	
$(+) \times (-)$ becomes -	eg. $(-5) \times 3 = -15$
$(-) \times (+)$ becomes -	

Grade 2

Adding Integers and Decimals	17
Subtracting Integers and Decimals	18
Multiplying Integers	19
Dividing Integers	20
Inverse Operations	21
Money Questions	22
Negatives in Real Life	23
Introduction to Fractions	24
Equivalent Fractions	25
Simplifying Fractions	26
Half-Way Values	27
Factors, Multiples and Primes	28
Introduction to Powers/Indices	29
Multiply and Divide by Powers of 10	30
Rounding to the Nearest 10, 100 etc	31
Rounding to Decimal Places	32
Simplifying - Addition and Subtraction	33
Simplifying - Multiplication	34
Simplifying - Division	35
Function Machines	36
Generating a Sequence - Term to Term	37
Introduction to Ratio	38
Using Ratio for Recipe Questions	39
Introduction to Percentages	40
Value for Money	41
Introduction to Proportion	42
Properties of Solids	43
Nets	44
Angles on a Line and at a Point	45
Measuring and Drawing Angles	46
Drawing a Triangle Using a Protractor	47
Reflections	48
Rotations	49
Translations	50
Plans and Elevations	51
Perimeters	52
Area of a Rectangle	53
Area of a Triangle	54
Area of a Parallelogram	55
Area of a Trapezium	56
Frequency Trees	57
Listing Outcomes	58
Calculating Probabilities	59
Mutually Exclusive Events	60
Two-Way Tables	61
Averages and the Range	62
Data - Discrete and Continuous	63
Vertical Line Charts	64
Frequency Tables and Diagrams	65



$$\text{Area of a triangle} = \frac{b \times h}{2}$$



$$\text{Area of trapezium} = \frac{1}{2}(a + b)h$$

Prime Numbers

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, . . .

Each prime number has exactly two factors.

Grade 3

Multiplying Decimals	66
Dividing Decimals	67
Four Rules of Negatives	68
Listing Strategies	69
Comparing Fractions	70
Adding and Subtracting Fractions	71
Finding a Fraction of an Amount	72
Multiplying Fractions	73
Dividing Fractions	74
BODMAS/BIDMAS	75
Reciprocals	76
Calculator Questions	77
Product of Primes	78
Highest Common Factor (HCF)	79
Lowest Common Multiple (LCM)	80
Squares, Cubes and Roots	81
Working with Indices	82
Standard Form	83
Decimals and Fractions	84
Fractions, Percentages, Decimals	85
Percentage of an Amount (Calc.)	86
Percentage of an Amount (Non-Calc.)	87
Change to a Percentage (Calc.)	88
Change to a Percentage (Non-Calc.)	89
Rounding to Significant Figures	90
Estimating Answers	91
Using Place Value	92
Expanding Brackets	93
Simple Factorisation	94
Substitution	95
Straight Line Graphs	96
The Gradient of a Line	97
Drawing Quadratic Graphs	98
Sketching Functions	99
Solving Equations Using Flowcharts	100
Subject of a Formula Using Flowcharts	101
Generate a Sequence from n th Term	102
Finding the n th Term	103
Special Sequences	104
Exchanging Money	105
Sharing Using Ratio	106
Ratios, Fractions and Graphs	107
Increase/Decrease by a Percentage	108
Percentage Change	109
Reverse Percentage Problems	110
Simple Interest	111
Metric Conversions	112
Problems on Coordinate Axes	113
Surface Area of a Prism	114
Volume of a Cuboid	115
Circle Definitions	116
Area of a Circle	117
Circumference of a Circle	118
Volume of a Prism	119
Angles and Parallel Lines	120
Angles in a Triangle	121
Properties of Special Triangles	122
Angle Sum of Polygons	123
Bearings	124
Experimental Probabilities	125
Possibility Spaces	126
Venn Diagrams	127
Representing Data	128
Scatter Diagrams	129
Averages From a Table	130

Grade 4

Index Notation	131
Introduction to Bounds	132
Midpoint of a Line on a Graph	133
Expanding and Simplifying Brackets	134
Solving Equations	135
Rearranging Simple Formulae	136
Forming Formulae and Equations	137
Inequalities on a Number Line	138
Solving Linear Inequalities	139
Simultaneous Equations Graphically	140
Fibonacci Sequences	141
Compound Units	142
Distance-Time Graphs	143
Similar Shapes	144
Constructions Using Compasses	145
Loci	146
Drawing a Triangle Using Compasses	147
Enlargements	148
Tangents, Arcs, Sectors and Segments	149
Pythagoras' Theorem	150
Simple Tree Diagrams	151
Sampling Populations	152
Time Series	153

The Laws of Indices

$$x^a \times x^b = x^{a+b}$$

$$x^a \div x^b = x^{a-b}$$

$$(x^a)^b = x^{ab}$$

$$x^{-a} = \frac{1}{x^a}$$

Pythagoras

$$a^2 + b^2 = c^2$$



Homework 1 – Non-Calculator

1 Write 40 673 to the nearest thousand.

.....

(Total for Question 1 is 1 mark)

2 Change 8 kilometres into metres.

..... metres

(Total for Question 2 is 1 mark)

3 Write the following numbers in order of size.
Start with the smallest number.

0.5 0.577 0.507 0.57 0.05

.....

(Total for Question 3 is 1 mark)

4 Write 150 minutes in hours and minutes.

..... hours minutes

(Total for Question 4 is 1 mark)

5 Fiona recorded the temperature, in °C, at 9 am on seven different days in December.

Here are her results.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature (°C)	5	4	1	−4	−6	−2	2

(a) Work out the difference between the temperature at 9 am on Monday and the temperature at 9 am on Friday.

.....°C
(1)

(b) Find the median temperature.

.....°C
(2)

(Total for Question 5 is 3 marks)

6 Which is larger, 25% or $\frac{3}{10}$?

You must show how you get your answer.

.....

(Total for Question 6 is 2 marks)

7 A ticket for a seat at a concert costs £8.75

There are 19 rows of seats.
There are 28 seats in each row.

The tickets for 100 of the seats have **not** been sold.

Work out an estimate for the total cost of the tickets that have been sold.

£.....
(3)

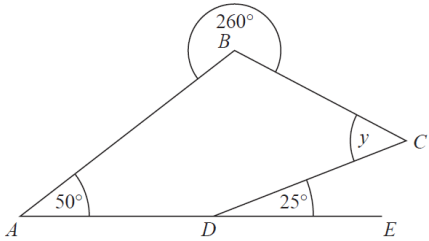
(Total for Question 7 is 3 marks)

8 Solve $4y - 7 = 29$

$y =$

(Total for Question 8 is 2 marks)

9



$ABCD$ is a quadrilateral.
 ADE is a straight line.

Find the size of the angle marked y .
Give a reason for each stage of your working.

.....°

(Total for Question 9 is 4 marks)

10 Solve the simultaneous equations

$$\begin{aligned}x - 5y &= 10 \\ 3x + y &= 6\end{aligned}$$

$x =$

$y =$

(Total for Question 10 is 3 marks)

11 (a) Work out $\frac{4}{5} \times \frac{1}{3}$

.....
(1)

(b) Work out $\frac{3}{8} + \frac{1}{5}$

.....
(2)

(Total for Question 11 is 3 marks)

12 Write the ratio 150 : 450 in the form 1 : n where n is a whole number.

.....
(Total for Question 12 is 2 marks)

13 (a) Write 247 000 in standard form.

.....
(1)

(b) Write 6.5×10^{-4} as an ordinary number.

.....
(1)

(c) Work out $(3 \times 10^{-7}) \times (8 \times 10^{-6})$
Give your answer in standard form.

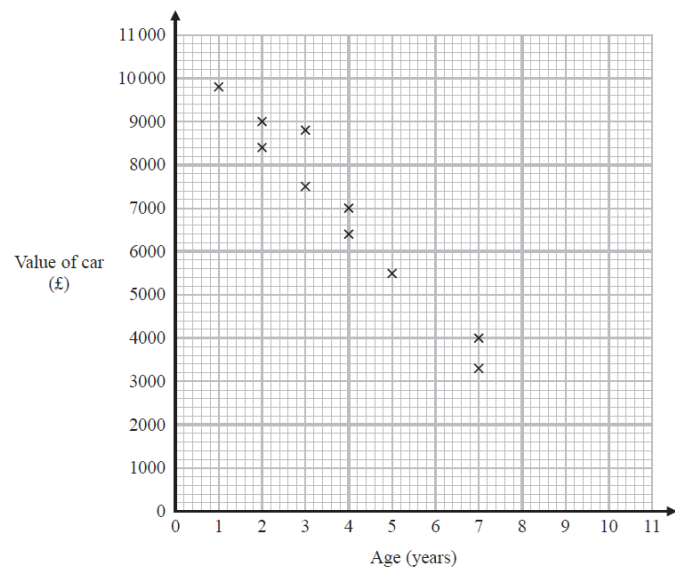
.....
(2)

(Total for Question 13 is 4 marks)

14 Expand and simplify $2(m - 3) + 3(m + 4)$

.....
(Total for Question 14 is 1 marks)

- 15 The scatter graph shows the age and the value of each of ten cars of the same make and model.



- (a) Describe the relationship between the value of a car and the age of the car.

.....

(1)

- (b) Draw a line of best fit on the scatter graph.

(1)

It may not be reliable to use the line of best fit to predict the value of a car that is 10 years old.

- (c) Give a reason why.

.....

(1)

(Total for Question 15 is 3 marks)

- 16 There are 270 students in Year 7
 Each student studies one of French or German or Spanish.

Of these 270 students

$\frac{2}{9}$ study French

the number who study French : the number who study Spanish = 3 : 7
 42 boys study German

Of the students who study German, what percentage are boys?
 You must show your working.

.....%

(Total for Question 16 is 5 marks)

Homework 2

1 Write the following numbers in order of size.
Start with the smallest number.

0 -1 3 5 -4

.....

(Total for Question 1 is 1 mark)

2 Write the ratio 3 : 12 in its simplest form.

.....

(Total for Question 2 is 1 mark)

3 Write down all the factors of 8

.....

(Total for Question 3 is 1 mark)

4 Write $\frac{30}{100}$ as a percentage.

.....%





(Total for Question 4 is 1 mark)

5 Change 250 millimetres to centimetres.


..... Centimetres

(Total for Question 5 is 1 mark)

7 The pictogram gives information about the number of cakes sold in a shop on Monday, on Tuesday, on Wednesday and on Thursday last week.

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

Key:



represents 16 cakes

(a) How many cakes were sold on Thursday?

..... (1)

(b) Work out the total number of cakes sold on Monday, Tuesday and Wednesday.

..... (2)

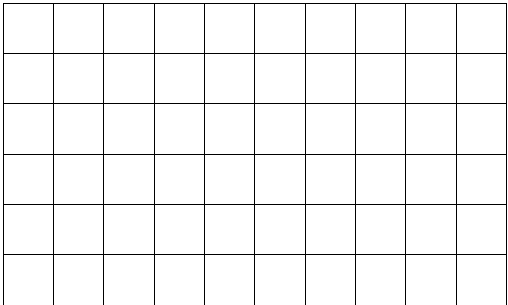
On Friday 36 cakes were sold.

(c) Show this information on the pictogram.

..... (1)

(Total for Question 7 is 4 marks)

11 Here is a centimetre grid.



On the grid, draw a rectangle with a perimeter of 20 cm.

(Total for Question 11 is 2 marks)

12 Michelle cycles for 3 hours at an average speed of 27 km/h.

(a) How many kilometres does Michelle cycle?

..... km
(2)

Josh cycles 124 km in 4 hours.

(b) What is his average speed?

.....
km/h
(2)

(Total for Question 12 is 4 marks)

14 (a) Write 16.45 correct to 1 decimal place.

.....
(1)

(b) Write 4136 correct to 2 significant figures.

.....
(1)

(Total for Question 14 is 2 marks)

15

(a) Work out the value of $5x^3$ when $x = 2$

.....
(1)

(b) Simplify $2a^3 \times a^4$

.....
(1)

(c) Simplify $12x^5y^2 \div 3x^2y$

.....
(2)

(Total for Question 15 is 4 marks)

16 Here is a list of ingredients for making 12 rock cakes.

Rock Cakes	
Ingredients for 12 rock cakes	
225 g	flour
75 g	sugar
100 g	dried fruit
50 ml	oil
75 ml	milk

Nishat has

800 g flour
300 g sugar

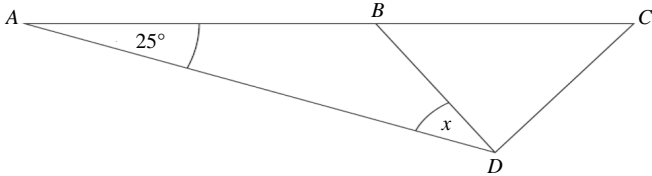
She has plenty of all the other ingredients.

Nishat wants to make 42 rock cakes.

Does she have enough flour and enough sugar to make 42 rock cakes?
You must show how you get your answer.

(Total for Question 16 is 3 marks)

17 The diagram shows triangle ABD and triangle BCD.



ABC is a straight line.
BCD is an equilateral triangle.

Angle DAB = 25°

Work out the size of the angle marked x.
Give a reason for each stage of your working.

.....°

(Total for Question 17 is 4 marks)

20 Find the highest common factor (HCF) of 90 and 126

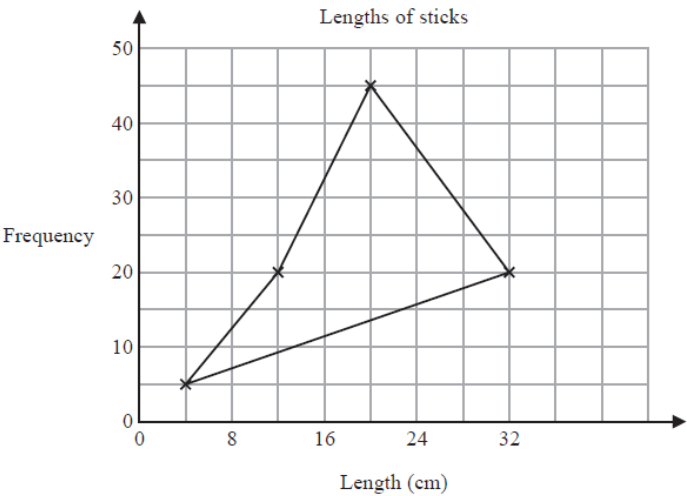
.....

(Total for Question 20 is 3 marks)

24 The table gives information about the length of each of 90 sticks.

Length (b cm)	Frequency
$0 < b \leq 8$	5
$8 < b \leq 16$	20
$16 < b \leq 24$	45
$24 < b \leq 32$	20

Jenny drew the frequency polygon below for the information in the table.
The frequency polygon is **not** correct.



Write down **two** things that are wrong with the frequency polygon.

- 1
-
- 2
-

(Total for Question 24 is 2 marks)

28 Here are the first four terms of an arithmetic sequence.

$$-6 \qquad -2 \qquad 2 \qquad 6$$

(a) Find an expression, in terms of n , for the n th term of this sequence.

.....
(2)

(b) Find the 10th term of this sequence.

.....
(1)

(Total for Question 28 is 3 marks)

29 (a) Factorise fully $6m^2 + 8mp$

.....
(2)

(b) Expand and simplify $(x - 7)(x + 4)$

.....
(2)

(Total for Question 29 is 4 marks)

Homework 3 - Calculator

1 Write 0.9 as a fraction.

(Total for Question 1 is 1 mark)

2 Change 4000 millilitres into litres.

(Total for Question 2 is 1 mark)

4 Simplify $6k \times 2t$

(Total for Question 4 is 1 mark)

5 (a) Simplify $4m - m + 3m$

(1)

(b) Simplify $5n - 4 + 2n + 3$

(2)

(Total for Question 5 is 3 marks)

6 Mehvish buys $\frac{1}{2}$ kg carrots, 3 kg potatoes, 2 kg onions and $1\frac{1}{2}$ kg of chicken.

Price list	
carrots	50p per kg
potatoes	64p per kg
onions	42p per kg
chicken	£6 per kg

She pays with a £20 note.

Work out the change that Mehvish should get.

£.....

(Total for Question 6 is 5 marks)

7 Here are three symbols.

=	<	>
---	---	---

Write one of these symbols on each dotted line to make four true statements.

$(-8)^2$ -16
 $20 - 5 \times 2$ 30
 $\sqrt{400}$ 20
 $y \times y$ y^2

(Total for Question 7 is 3 marks)

8 Here are four fractions.

$\frac{2}{3}$

$\frac{5}{8}$

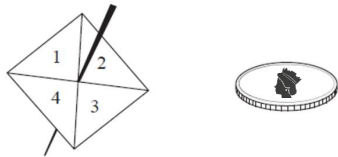
$\frac{3}{5}$

$\frac{7}{11}$

Write the fractions in order of size.
Start with the smallest fraction.

.....
(Total for Question 8 is 2 marks)

9 Here is a fair 4-sided spinner and a fair coin.



Sophie spins the spinner once and throws the coin once.

(a) List all the possible outcomes. The first one has been done for you.

(1, H)
.....
.....
(2)

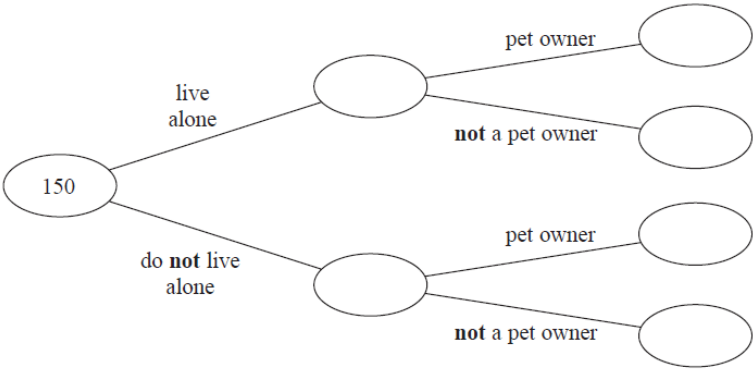
(b) Find the probability that Sophie will get an even number and a head.

.....
(2)
(Total for Question 9 is 4 marks)

10 150 people live in a village.
Some of these people are pet owners.

45 of the people live alone.
30 of the pet owners do **not** live alone.
50 of the people are pet owners.

(a) Use this information to complete the frequency tree.



(3)

(b) Write down the number of pet owners who live alone as a fraction of the total number of people who live alone.
Give your fraction in its simplest form.

.....
(2)
(Total for Question 10 is 5 marks)

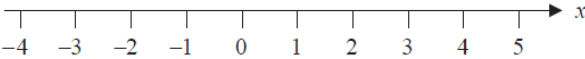
11 (a) Factorise $w^2 + 4w$

.....
(1)

(b) Solve $5(2p - 3) = 30$

$p =$
(3)

(c) Show the inequality $-1 \leq x < 4$ on the number line below.



(2)

(Total for Question 11 is 6 marks)

12 The table shows information about the distances travelled by 50 new cars before a tyre was changed.

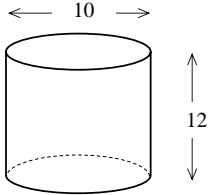
Distance (d km)	Number of cars
$5000 \leq d < 25\,000$	9
$25\,000 \leq d < 45\,000$	25
$45\,000 \leq d < 65\,000$	16

Calculate an estimate for the mean distance.

..... km

(Total for Question 12 is 3 marks)

13 The diagram shows a cylinder with diameter 10 cm and height 12 cm.



Calculate the volume of this cylinder.
Give your answer correct to 3 significant figures.

.....cm³

(Total for Question 13 is 2 marks)