

# MATHS Unit 1

Making generalisations about the number system: the grammar of written calculations

## NUMBERS KEYWORDS

Keywords	Definition/Tips	Example
Integer	A whole number that can be positive, negative or zero.	-3, 0, 92
Decimal	A number with a decimal point in it. Can be positive or negative.	3.7, 0.94, -24.1
Negative Number	A number that is less than zero. Can be decimals.	-8, -2.5
Addition	To find the total, or sum, of two or more numbers. 'add', 'plus', 'sum'	$3 + 2 + 7 = 12$
Subtraction	To find the difference between two numbers. To find out how many are left when some are taken away. 'minus', 'take away', 'subtract'	$10 - 3 = 7$
Multiplication	Can be thought of as <b>repeated addition</b> . 'multiply', 'times', 'product'	$3 \times 6 = 6 + 6 + 6 = 18$
Division	Splitting into equal parts or groups. The process of calculating the <b>number of times one number is contained within another one</b> . 'divide', 'share', 'split'	$20 \div 4 = 5$ $\frac{20}{4} = 5$
Remainder	The amount ' <b>left over</b> ' after dividing one integer by another.	The remainder of $20 \div 6$ is 2, because 6 divides into 20 exactly 3 times, with 2 left over.

## PLACE VALUES

The position of each digit in a number tells you its value:

Whole Part						Decimal Part		
Ten Thousands (T Th)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)	Decimal Point	Tenths (t)	Hundredths (h)	Thousandths (th)
1	3	5	4	8	.	2	5	3

Place value of 1 = 10000  
 Place value of 3 = 3000  
 Place value of 5 = 500  
 Place value of 4 = 40  
 Place value of 8 = 8  
 Place value of 2 = 0.2  
 Place value of 5 = 0.05  
 Place value of 3 = 0.003



13548.253

The number above in word is:  
 Thirteen thousand, five hundred and forty-eight point two five three

## ADDITION AND SUBTRACTION

There are many different strategies for adding and subtracting numbers. Some examples are given below:

### Mental Strategies

Using **compensation** for addition:

$$287 + 198 = 287 + 200 - 2 = 487 - 2 = 485$$

Using **compensation** for subtraction:

$$582 - 299 = 582 - 300 + 1 = 282 + 1 = 283$$

### Written Strategies

789 + 642 becomes

$$\begin{array}{r} 789 \\ + 642 \\ \hline 1431 \end{array}$$

Answer: 1431

874 - 523 becomes

$$\begin{array}{r} 874 \\ - 523 \\ \hline 351 \end{array}$$

Answer: 351

932 - 457 becomes

$$\begin{array}{r} 932 \\ - 457 \\ \hline 475 \end{array}$$

Answer: 475

## MULTIPLICATION AND DIVISION

There are many different strategies for multiplying and dividing numbers. Some examples are given below:

### Multiplication

#### Long

$124 \times 26$  becomes

$$\begin{array}{r} \phantom{1} \phantom{2} \\ 1 \phantom{2} \phantom{4} \\ \times \phantom{2} \phantom{6} \\ \hline 2 \phantom{4} \phantom{8} \phantom{0} \\ + \phantom{7} \phantom{4} \phantom{4} \\ \hline 3 \phantom{2} \phantom{2} \phantom{4} \\ \hline 1 \phantom{1} \end{array}$$

Answer: 3224

#### Short

$342 \times 7$  becomes

$$\begin{array}{r} \phantom{3} \phantom{4} \phantom{2} \\ 3 \phantom{4} \phantom{2} \\ \times \phantom{7} \\ \hline 2 \phantom{3} \phantom{9} \phantom{4} \\ \hline 2 \phantom{1} \end{array}$$

Answer: 2394

### Division

#### Long

$432 \div 15$  becomes

$$\begin{array}{r} \phantom{2} \phantom{8} \phantom{8} \\ 1 \phantom{5} \overline{) 4 \phantom{3} \phantom{2} \phantom{0}} \\ \underline{3 \phantom{0}} \phantom{0} \phantom{0} \phantom{0} \\ \phantom{1} \phantom{3} \phantom{2} \phantom{0} \\ \underline{1 \phantom{2} \phantom{0}} \phantom{0} \phantom{0} \\ \phantom{1} \phantom{2} \phantom{0} \phantom{0} \\ \underline{1 \phantom{2} \phantom{0}} \phantom{0} \\ \phantom{0} \end{array}$$

Answer: 28.8

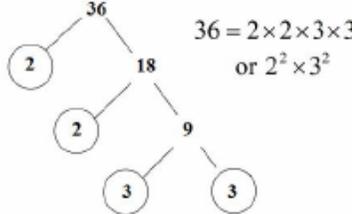
#### Short

$98 \div 7$  becomes

$$\begin{array}{r} \phantom{1} \phantom{4} \\ 7 \overline{) 9 \phantom{8}} \\ \underline{7 \phantom{8}} \\ \phantom{2} \end{array}$$

Answer: 14

## FACTORS AND MULTIPLES

Keywords	Definition/Tips	Example
Multiple	The result of multiplying a number by an integer. The times tables of a number.	The first five multiples of 7 are: 7, 14, 21, 28, 35
Factor	A number that divides exactly into another number without a remainder. It is useful to write factors in pairs +	The factors of 18 are: 1, 2, 3, 6, 9, 18 The factor pairs of 18 are: 1, 18 2, 9 3, 6
Lowest Common Multiple (LCM)	The smallest number that is in the times tables of each of the numbers given.	The LCM of 3, 4 and 5 is 60 because it is the smallest number in the 3, 4 and 5 times tables.
Highest Common Factor (HCF)	The biggest number that divides exactly into two or more numbers.	The HCF of 6 and 9 is 3 because it is the biggest number that divides into 6 and 9 exactly.
Prime Number	A number with exactly two factors. A number that can only be divided by itself and one. The number 1 is not prime, as it only has one factor, not two.	The first ten prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
Prime Factor	A factor which is a prime number.	The prime factors of 18 are: 2, 3
Product of Prime Factors	Finding out which prime numbers multiply together to make the original number. Use a prime factor tree. Also known as 'prime factorisation'.	 $36 = 2 \times 2 \times 3 \times 3$ or $2^2 \times 3^2$