

**Key Vocabulary**

Improper fraction / Top-heavy fraction	Where the numerator is larger than the denominator $\frac{12}{5}$
Mixed number	A fraction with a whole number an $3\frac{2}{5}$
Operation	There are four main mathematical operations Addition + Subtraction – Multiplication x Division ÷
Order of operations	The order you MUST follow when applying mathematical operations
Inverse	The opposite operation; opposite of add is subtract opposite of multiply is divide
Long multiplication	An efficient method for multiplying two large numbers
Short division	An efficient method for dividing a large number by another number
Remainder	A part, number or quantity that is leftover after a division
Place value	The position of a digit in a number
Indices, powers, index/power $7^4 = 7 \times 7 \times 7 \times 7$	The number times itself that many times is the index/power

**Key facts / Diagrams**

**Place Values**

Hundred Thousand	Ten Thousand	Thousands	Hundreds	Tens	Units	Tenths	Hundredths	Thousandths	
		3	5	8	7	.	0	0	0
Three thousand, five hundred and eighty seven									
2	9	7	6	5	0	.	6	2	5
Two hundred and ninety-seven thousand, six hundred and fifty, and six hundred twenty-five thousandths									

**BIDMAS – the order of operations**

<b>B</b>	<b>Brackets</b>
<b>I</b>	<b>Indices</b>
<b>D</b>	<b>Division</b>
<b>M</b>	<b>Multiplication</b>
<b>A</b>	<b>Addition</b>
<b>S</b>	<b>Subtraction</b>

**Inverse Operations**

$+$ → $-$	$\times$ → $\div$
$4 + 7 = 11$	$6 \times 3 = 18$
$11 - 7 = 4$	$18 \div 6 = 3$

You must have an efficient method for long multiplication and division. It does not need to be the methods demonstrated under the worked examples, but you must ensure you can do these sorts of sums accurately!!!

**Common misconceptions**

- The use of BIDMAS can imply that division takes priority over multiplication, and that addition takes priority over subtraction. This can result in incorrect calculations.
- Pupils may incorrectly apply place value when dividing by a decimal for example by making the answer 10 times bigger when it should be 10 times smaller.

**Worked examples**

1. Work out  $153 \times 4.2$   
Remove decimal point and do the multiplication

$$\begin{array}{r} 153 \\ \times 42 \\ \hline 306 \\ 6120 \\ \hline 6426 \end{array}$$

Put the point back in at the relevant place  
= 642.6

2. Work out  $782 \div 8$

$$8 \overline{) 097.75} \\ \underline{78} \phantom{00} \\ 17 \phantom{00} \\ \underline{16} \phantom{00} \\ 170 \\ \underline{160} \\ 100 \\ \underline{80} \\ 200 \\ \underline{160} \\ 400 \\ \underline{400} \\ 000$$

=  
97.75

3. Work out  $20 - 12 \div 3$   
 $20 - 4 = \underline{16}$