Chapter 1

Fundamental Arithmetic

Table 1-1: Numbers, their factors and prime factors

Number	Factors	Prime factor(s)	Expression (as a product)
9	$1, 3, 9$	3	$9 = 3 \times 3$
12	$1, 2, 3, 4, 6, 12$	$2, 3$	$12 = 2 \times 2 \times 3$
15	$1, 3, 5, 15$	$3, 5$	$15 = 3 \times 5$
21	$1, 3, 7, 21$	$3, 7$	$21 = 3 \times 7$
27	$1, 3, 9, 27$	3	$27 = 3 \times 3 \times 3$
33	$1, 3, 11, 33$	$3, 11$	$33 = 3 \times 11$

Table 1-2: Illustrating mathematical operators

Operator	Symbol	Note
Addition	$+$	The word '**sum**' is also used to imply addition. Examples: ▪ $3 + 7 = 10$ ▪ $x + 5x = 6x$
Subtraction	$-$	The word '**minus**' is also used to mean subtraction. Examples: ▪ $20 - 14 = 6$ ▪ $13m - 5m = 8m$
Multiplication	$\times$	The word '**times**', '**product**' and '**of**' are all used to represent multiplication. Other symbols include asterisk ($*$) and dot ($\cdot$). Examples: ▪ $3 \times 7 = 21$. Alternatively, we can write the same operation as $3 * 7 = 21$ or $(3).(7) = 21$. To avoid confusion, a dot as a multiplication sign is not often used with numbers which is why we need the brackets, otherwise it could be mistaken for a decimal number 3.7 (three point seven). ▪ $2 \times 5x = 10x$
Division	$\div$	The word '**over**' is used to mean division. Forward slash **(/)** is also used to represent division. Examples: ▪ $35 \div 5 = 7$. Alternatively, we can write the same operation as $\frac{35}{5} = 7$ or ${}^{35}/_{5} = 7$ or $35/5 = 7$. ▪ $4m \div m = 4$. We will cover this further in Chapter 3.
Roots	$\sqrt[n]{\ }$	This will be discussed shortly.
Powers:		This does not have a given sign or symbol, but it is known by placing it to the top-right corner of a number or a variable. ▪ $3^2 = 9$ ▪ m^2

Table 1-3: Priority order of mathematical operation explained

Priority Order	Letter	Operator
1st	B	Brackets
2nd	I	Indices / Powers or Roots
3rd	D	Division
	M	Multiplication
4th	A	Addition
	S	Subtraction

Table 1-4: Rules of multiplying and dividing negative numbers

	Operation	Result	Example
Multiplication	$(positive) \times (positive)$	positive	$(3) \times (4) = 12$
	$(positive) \times (negative)$	negative	$(3) \times (-4) = -12$
	$(negative) \times (positive)$	negative	$(-3) \times (4) = -12$
	$(negative) \times (negative)$	positive	$(-3) \times (-4) = 12$
Division	$(positive) \div (positive)$	positive	$(30) \div (6) = 5$
	$(positive) \div (negative)$	negative	$(30) \div (-6) = -5$
	$(negative) \div (positive)$	negative	$(-30) \div (6) = -5$
	$(negative) \div (negative)$	positive	$(-30) \div (-6) = 5$

Thank You