SOME MATHS REVISION

There are good websites that can help you if any of the maths in this book confuses you. The pages at study-maths.co.uk, www.gcflearnfree.org/math, and www.mathsisfun.com look useful, but there are many others, so use a search engine to find something that suits you. Some resources are also available on the book's website so you can try there if you run out of inspiration. I will quickly remind you of three important things:

Two negatives make a positive: Although in life two wrongs don't make a right, in mathematics they do. When we multiply a negative number by another negative number, the result is a positive number. For example, $-2 \times -4 = 8$.

A negative number multiplied by a positive one make a negative number: If you multiply a positive number by a negative number then the result is another negative number. For example, $2 \times -4 = -8$, or $-2 \times 6 = -12$.

BODMAS and PEMDAS: These two acronyms are different ways of remembering the order in which mathematical operations are performed. BODMAS stands for Brackets, Order, Division, Multiplication, Addition, and Subtraction; whereas PEMDAS stems from Parentheses, Exponents, Multiplication, Division, Addition, and Subtraction. Having two widely used acronyms is confusing (especially because multiplication and division are the opposite way around), but they do mean the same thing:

- Brackets/Parentheses: When solving any expression or equation you deal with anything in brackets/parentheses first.
- Order/Exponents: Having dealt with anything in brackets, you next deal with any order terms/exponents. These refer to power terms such as squares. Four squared, or 4^2, used to be called four raised to the order of 2, hence the word 'order' in BODMAS. These days, the term 'exponents' is more common (so by all means use BEDMAS as your acronym if you find that easier).
- Division and Multiplication: The next things to evaluate are any division or multiplication terms. The order in which you handle them is from the left to the right of the expression/equation. That's why BODMAS and PEMDAS can list them the opposite way around, because they are considered at the same time (so, BOMDAS or PEDMAS would work as acronyms, too).
- Addition and Subtraction: Finally, deal with any addition or subtraction. Again, go from left to right, doing any addition or subtraction in the order that you meet the terms. (So, BODMSA would work as an acronym too, but it's hard to say.)

Let's look at an example of BODMAS/PEMDAS in action: what would be the result of $1 + 3 \times 5^2$? The answer is 76 (not 100 as some of you might have thought). There are no brackets, so the first thing is to deal with the order/exponent: 5^2 is 25, so the equation becomes $1 + 3 \times 25$. Moving from left to right, there is no division, so we do the multiplication: 3×25, which gives us 75. Again, going from left to right, we look for addition and subtraction terms – there are no subtractions, so the first thing we come across is the addition: $1 + 75$, which gives us 76 and the expression is solved. If I'd written the expression as $(1 + 3) \times 5^2$, then the answer would have been 100 because we deal with the brackets first: $(1 + 3) = 4$, so the expression becomes 4×5^2. We then deal with the order/exponent (5^2 is 25), which results in $4 \times 25 = 100$.