# Background reading for Quantitative Business Analysis (QBA1)

The content of the following two books is similar to QBA1, but not identical (they also includes content that we do not cover in QBA1 and we cover material that is not in these books).

Mendenhall, W., Beaver, R. and Beaver, B. (2012) *Introduction to Probability & Statistics* (14th ed), Cengage Learning

Rowntree, D., (2000) *Statistics without tears: An introduction for non-mathematicians* (2nd ed) Penguin Books: London.

The following tables shows the topics covered in QBA1 and the corresponding chapters in these two books.

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| QBA1 sections | Chapter in Mendenhall et al (2012) | Chapter in Rowntree (2000) |
| 1. Introduction | Intro | Intro, 1 |
| 1. Visualisation of Data | 1 | 2, 3 |
| 1. Summarising Data | 2, 3 | 2, 3 |
| 1. Foundations of Probability | 4 | 4 |
| 1. Probability Distributions | 4, 5, 6 | 4 |
| 1. Inference | 7, 8 | 5 |
| 1. Hypothesis Testing and Contingency Tables | 9, 10,  14 | 6, 7 |

We move quite quickly though sections 1 – 3 as it is assumed students will have encountered some of this material before. Therefore, in preparation for the course, reading the chapters associated to these sections would be a good place to start.

Of the lists of “Expected Mathematical Knowledge” (see page 2), having an understanding of points 1, 2, 3, 4 and 7 is most important for QBA1. You should also be aware of points 5, 6 and 8; however a solid understanding is not required.

For background reading about algebraic notation and manipulation; logs and exponentials; graphs of simple functions; and finite sums there are a number of sources.

Chapter 2 in Wisniewski, M. (2009) *Quantitative Methods for Decision Makers.* Pearson Education Ltd: Essex.

This chapter also contains information about fractions, percentages, proportions, rounding and common mathematical notation. Chapters 3, 4, 5 and 7 also cover some of the topics in the course, however have a managerial focus, so do not go into as much depth as we do.

Beveridge, C. (2011) Basic Maths for Dummies. Wiley & Sons: Chichester.

This book covers a wider range of mathematical techniques and tools and is available online through the University Library.

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| **Annex 3: Expected mathematical knowledge** |

1. Ability to use a scientific calculator

Capable of using and understanding functions such as exp, log, x^y on a calculator.

1. Algebraic notation and manipulation; subscripts; simple results.

Should feel comfortable manipulating equations and working with subscript notation. For example, student should be able to solve a quadratic equation, such as .

1. Logs and exponentials

Have a general understanding of the use of logs and exponentials. The ability to carry out logarithmic transformations. An understanding of the logarithmic and exponential laws of summation, division etc.

1. Graphs of simple functions.

Ability to draw and interpret graphs of simple linear and non-linear mathematical functions.

1. Differentiation (including differentiation of a product). The idea of a differential equation

An understanding of when differentiation is used. Ability to carry out differentiation on different functions, including functions that include the product of two variables. A basic understanding of how to solve equations that involve one or more derivatives.

1. An understanding of what integration is. Integration of polynomials and ex; integration by parts

Understanding of when the use of integration is appropriate and the ability to carry out the integration of functions that contain variables with nonnegative integer powers.

1. Finite sums. Infinite sums of xi and xi /i!

Ability to carry out sums of arithmetic and geometric series.

Ability to sum infinite series of elements that have the form ∑xi or ∑xi/i!, where, for example, i = 1 to ∞

1. Simple manipulation of vectors and matrices

Ability to carry out simple manipulation, such as addition, subtraction and multiplication of vectors and matrices.