# Contents

<table>
<thead>
<tr>
<th>Introduction</th>
<th>vii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>vii</td>
</tr>
</tbody>
</table>

## Chapter 1

**Earning and managing money**

1.1 Salary and wages  1
1.2 Overtime and special allowances  6
1.3 Annual leave loading and bonuses  11
1.4 Commission  15
1.5 Piecework, royalties and income from government  18
1.6 Gross pay, net pay and deductions  22
1.7 Budgeting  27

**Chapter summary**  31
Sample HSC – Objective-response questions  32
Sample HSC – Short-answer questions  33

## Chapter 2

**Algebraic manipulation**  35

2.1 Adding and subtracting like terms  35
2.2 Multiplication and division of algebraic terms  39
2.3 Expanding algebraic expressions  43
2.4 Factorising algebraic expressions  47
2.5 Substitution  50
2.6 Linear equations  53
2.7 Equations with fractions  60
2.8 Using formulas  63

**Chapter summary**  69
Sample HSC – Objective-response questions  70
Sample HSC – Short-answer questions  71

## Chapter 3

**Units of measurement and applications**  73

3.1 Units of measurement  73
3.2 Measurement errors  79
3.3 Scientific notation and significant figures  83
3.4 Calculations with ratios  88
3.5 Rates and concentrations  92
3.6 Percentage change  96

**Chapter summary**  99
Sample HSC – Objective-response questions  100
Sample HSC – Short-answer questions  101
Chapter 4  Statistics and society, data collection and sampling  103
  4.1  Statistical inquiry  103
  4.2  Classification of data  108
  4.3  Sample types  113
  4.4  Designing a questionnaire  118
Chapter summary  121
  Sample HSC – Objective-response questions  122
  Sample HSC – Short-answer questions  123

Chapter 5  Interpreting linear relationships  125
  5.1  Graphing linear functions  125
  5.2  Gradient and intercept  130
  5.3  Gradient-intercept formula  134
  5.4  Simultaneous equations  138
  5.5  Linear functions as models  142
Chapter summary  147
  Sample HSC – Objective-response questions  148
  Sample HSC – Short-answer questions  149

Chapter 6  Investing money  151
  6.1  Simple interest  151
  6.2  Simple interest graphs  156
  6.3  Compound interest  160
  6.4  Compound interest graphs  164
  6.5  Using prepared tables  168
  6.6  Financial institutions: costs  172
  6.7  Appreciation and inflation  175
  6.8  Shares and dividends  179
Chapter summary  183
  Sample HSC – Objective-response questions  184
  Sample HSC – Short-answer questions  185

HSC Practice Paper 1  187

Chapter 7  Displaying and interpreting single data sets  193
  7.1  Frequency tables  193
  7.2  Grouped frequency tables  197
  7.3  Cumulative frequency  200
  7.4  Range and interquartile range  204
  7.5  Frequency and cumulative frequency graphs  209
  7.6  Box-and-whisker plots  215
  7.7  Sector and divided bar graphs  220
  7.8  Radar charts  224
  7.9  Dot plots and stem-and-leaf plots  227
Chapter summary  231
  Sample HSC – Objective-response questions  232
  Sample HSC – Short-answer questions  233
Chapter 8  Applications of perimeter, area and volume  235
  8.1  Pythagoras’ theorem  235
  8.2  Perimeter  239
  8.3  Area  244
  8.4  Field diagrams  250
  8.5  Volume of prisms and cylinders  254
  8.6  Capacity  258
          Chapter summary  261
          Sample HSC – Objective-response questions  262
          Sample HSC – Short-answer questions  263

Chapter 9  Relative frequency and probability  265
  9.1  Relative frequency  265
  9.2  Multistage events  271
  9.3  Systematic lists  274
  9.4  Definition of probability  279
  9.5  Range of probabilities  283
  9.6  Complementary events  286
          Chapter summary  289
          Sample HSC – Objective-response questions  290
          Sample HSC – Short-answer questions  291

Chapter 10  Taxation  293
  10.1  Allowable deductions  293
  10.2  Taxable income  297
  10.3  Medicare levy  301
  10.4  Calculating tax  304
  10.5  Calculating GST  309
  10.6  Graphing tax rates  313
          Chapter summary  317
          Sample HSC – Objective-response questions  318
          Sample HSC – Short-answer questions  319

Chapter 11  Summary statistics  321
  11.1  The median  321
  11.2  Mean and mode  325
  11.3  The mean from larger data sets  330
  11.4  Standard deviation  335
  11.5  Comparison of summary statistics  339
          Chapter summary  343
          Sample HSC – Objective-response questions  344
          Sample HSC – Short-answer questions  345
## Chapter 12
Similarity and right-angled triangles 347
- **12.1** Similar figures and scale factors 347
- **12.2** Problems involving similar figures 352
- **12.3** Scale drawings 357
- **12.4** Trigonometric ratios 360
- **12.5** Using the calculator in trigonometry 365
- **12.6** Finding an unknown side 369
- **12.7** Finding an unknown angle 373
- **12.8** Applications of right-angled triangles 376
- **12.9** Angles of elevation and depression 380
- **Chapter summary** 385
- **Sample HSC – Objective-response questions** 386
- **Sample HSC – Short-answer questions** 387

## Chapter 13
Mathematics and communication 389
- **13.1** Mobile phone plans 389
- **13.2** Phone usage tables and graphs 396
- **13.3** File storage 399
- **13.4** Digital downloads 403
- **13.5** Digital download statistics 406
- **Chapter summary** 409
- **Sample HSC – Objective-response questions** 410
- **Sample HSC – Short-answer questions** 411

## Chapter 14
Mathematics and driving 413
- **14.1** Cost of purchase 413
- **14.2** Insurance 418
- **14.3** Stamp duty 421
- **14.4** Running costs 424
- **14.5** Straight-line depreciation 428
- **14.6** Declining balance depreciation 431
- **14.7** Safety 435
- **14.8** Blood alcohol content 441
- **14.9** Driving statistics 446
- **Chapter summary** 451
- **Sample HSC – Objective-response questions** 452
- **Sample HSC – Short-answer questions** 453

- **HSC Practice Paper 2** 455
- **HSC formula sheet** 461
- **Glossary** 463
- **Answers** 470
Introduction

*Cambridge Preliminary Mathematics General Second Edition* has been completely revised for the stage 6 Mathematics General syllabus to be implemented from 2013, and the HSC General 2 examination being implemented in 2014. The Preliminary course is a common preparation for both the General 1 and General 2 courses at HSC.

This textbook closely follows the syllabus and is divided into strands and focus studies. The focus studies are designed to be integrated across the strands. Teachers can decide on the integration according to the ability and knowledge of the students. A teaching program is provided that outlines one method of integration.

Key features:

- Preliminary course divided into smaller manageable topics to assist teaching.
- Clear design with appropriate diagrams and tables.
- Each section and exercise is easily accessible at the top of the page.
- Syllabus topic and content listed at the beginning of each chapter.
- Suggested teaching program for the new syllabus can be downloaded from Cambridge GO (www.cambridge.edu.au/go).
- Each new focus study is covered in its own chapter to provide easy access.
- Step-by-step worked examples with precise explanations to encourage independent learning.
- Extensive exercises divided into foundation and development questions that cater for students at different levels, and facilitate differentiation into General 1 and General 2 courses.
- Important concepts highlighted for easy reference.
- Excel spreadsheet activities integrated throughout the text.
• Graphics calculator explanations and problems integrated into the text.
• Chapter reviews containing a summary plus sample HSC objective-response (multiple-choice) and short-answer questions.
• The sample HSC objective response questions can also be done by students in a self-marking ‘Quiz Me’ format for web browsers and smartphones.
• Two complete HSC Practice Papers.
• Companion website on Cambridge GO with a downloadable digital version and an online interactive version of the textbook with links to additional resources.
• Comprehensive glossary and HSC formula sheet.

Also available to support and extend this text is the Cambridge Preliminary Mathematics General Teacher’s Resource Package on Cambridge GO. It contains PowerPoint presentations, spreadsheet skills, spreadsheet files, topic tests and a copy of the teaching program.
This textbook is supported and enhanced by online resources...

Cambridge GO
YOUR GATEWAY ONLINE
Digital resources and support material for schools.

About the additional online resources...

Additional resources are available free for users of this textbook online at Cambridge GO and include:

- the PDF Textbook – a downloadable version of the student text, with note-taking and bookmarking enabled
- extra material and activities
- links to other resources.

Use the unique 16 character access code found in the front of this textbook to activate these resources.

About the Interactive Textbook...

The Interactive Textbook is designed to make the online reading experience meaningful, from navigation to display. It also contains a range of extra features that enhance teaching and learning in a digital environment.

Access the Interactive Textbook by purchasing a unique 16 character access code from your Educational Bookseller, or you may have already purchased the Interactive Textbook as a bundle with this printed textbook. The access code and instructions for use will be enclosed in a separate sealed pocket.

The Interactive Textbook is available on a calendar year subscription. For a limited time only, access to this subscription has been included with the purchase of the enhanced version of the printed student text at no extra cost. You are not automatically entitled to receive any additional interactive content or updates that may be provided on Cambridge GO in the future.

Preview online at:
www.cambridge.edu.au/GO
Access online resources today at www.cambridge.edu.au/GO

1. **Log in** to your existing Cambridge GO user account
   OR
   **Create** a new user account by visiting:
   www.cambridge.edu.au/GO/newuser
   - All of your Cambridge GO resources can be accessed through this account.
   - You can log in to your Cambridge GO account anywhere you can access the internet using the email address and password with which you are registered.

2. **Activate** Cambridge GO resources by entering the unique access code found in the front of this textbook.
   **Activate** the Interactive Textbook by entering the unique 16 character access code found in the separate sealed pocket.
   - Once you have activated your unique code on Cambridge GO, you don’t need to input your code again. Just log in to your account using the email address and password you registered with and you will find all of your resources.

3. **Go** to the My Resources page on Cambridge GO and access all of your resources anywhere, anytime.*

---

* Technical specifications: You must be connected to the internet to activate your account and to use the Interactive Textbook. Some material, including the PDF Textbook, can be downloaded. To use the PDF Textbook you must have the latest version of Adobe Reader installed.

Contact us on 03 8671 1400 or help@cambridgego.com.au