

Haese Mathematics

Specialists in mathematics education

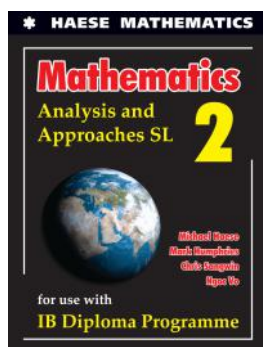
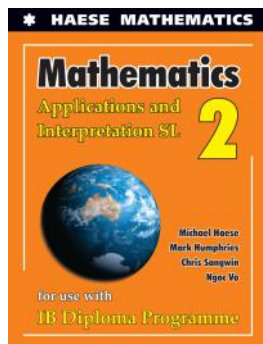
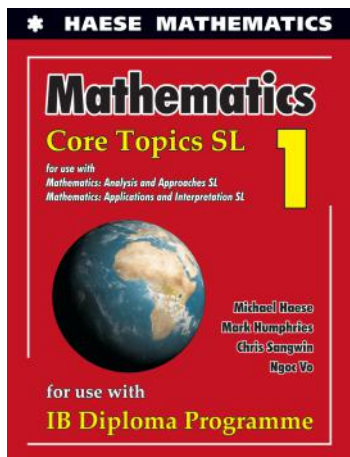
International Baccalaureate,
Diploma Programme
and
Middle Years Programme



International Baccalaureate Diploma Programme

We have produced a series of six textbooks for the new Diploma Program Mathematics courses for first assessment in May 2021. Students will need both book for the duration of their studies to cover all of the course content.

SL Mathematics

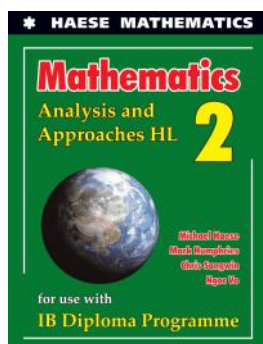
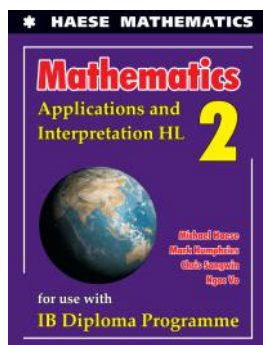
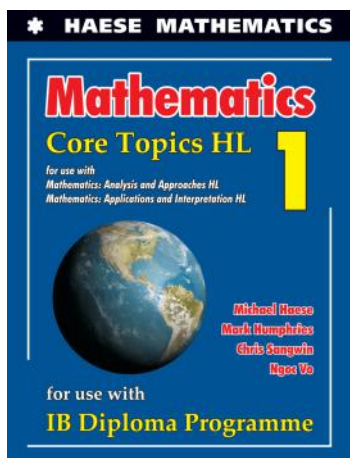


All students will start with a Core Topics book. These are taught first.

Students will then need one other book, based on their stream.



HL Mathematics



RIGHT ANGLED TRIANGLE TRIGONOMETRY (Chapter 7)

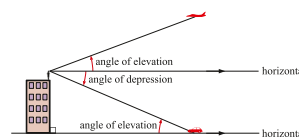
E PROBLEM SOLVING WITH TRIGONOMETRY

In this Section we consider practical applications of trigonometry. It allows us to find heights and distances which are very difficult or even impossible to measure directly.

ANGLES OF ELEVATION AND DEPRESSION

The angle between the horizontal and your line of sight to an object is called:

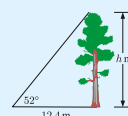
- the **angle of elevation** if you are looking upwards
- the **angle of depression** if you are looking downwards.



Example 8

Self Tutor

A tree casts a shadow of 12.4 m when the angle of elevation to the sun is 52° . Find the height of the tree.



Let the tree's height be h m.

For the 52° angle, $\text{OPP} = h$ m, $\text{ADJ} = 12.4$ m

$$\therefore \tan 52^\circ = \frac{h}{12.4}$$

$$\therefore 12.4 \times \tan 52^\circ = h$$

$$\therefore h \approx 15.9$$

\therefore the tree is about 15.9 m high.

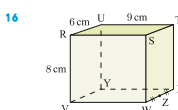
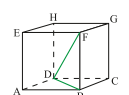
EXERCISE 7E

- A flagpole casts a shadow of 9.32 m when the angle of elevation to the sun is 63° . Find the height of the flagpole.
- A steep hill is inclined at 18° to the horizontal. It runs down to the beach so its base is at sea level.
 - If I walk 150 m up the hill, what is my height above sea level?
 - If I climb to a point 80 m above sea level, how far have I walked?
- A surveyor has placed two posts B and C 120 m apart on one side of a river. He crosses the river using a bridge, then moves to the point A which is directly opposite B. He finds that the angle of sight between the posts is 37° . How wide is the river?
- A train must climb a constant gradient of 5.5 m for every 200 m of track. Find the angle of incline.

Mathematics: Core Topics SL p185

172 RIGHT ANGLED TRIANGLE TRIGONOMETRY (Chapter 7)

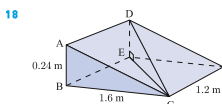
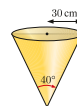
- The cube shown has sides of length 13 cm. Find:
 - BD
 - FDB.



In the rectangular prism shown, Z is the midpoint of [WX].

- Find:
- VX
 - $\angle \text{R}\hat{\text{X}}\text{V}$
 - YZ
 - $\angle \text{Y}\hat{\text{Z}}\text{U}$.

- An open cone has a vertical angle measuring 40° and a base radius of 30 cm. Find:
 - the height of the cone
 - the capacity of the cone in litres.

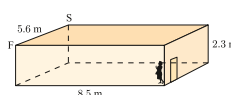


A ramp is built as the triangular prism shown.

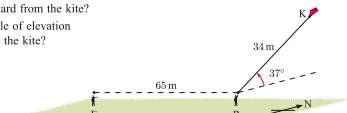
- Find the length:
- CE
 - CD.

Find $\angle \text{D}\hat{\text{C}}\text{E}$.

- Elizabeth is terrified of spiders. When she walks into a room, she notices one in the opposite corner S.
 - If Elizabeth is 1.6 m tall, how far is the spider from her head?
 - The spider can see up to an angle of 42° from the direction it is facing. This spider is facing a fly at F. Can it see Elizabeth?

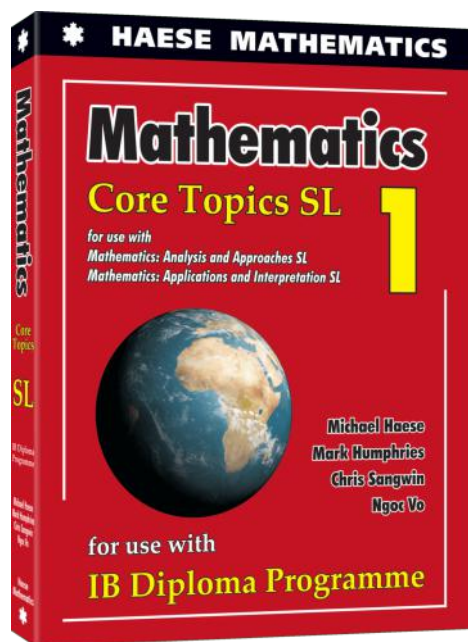


- Rico is flying his kite with the aid of a southerly wind. He has let out 34 m of string, and the kite is at an angle of elevation of 37° . His friend Edward stands to the west, 65 m away.
 - How far is Edward from the kite?
 - What is the angle of elevation from Edward to the kite?



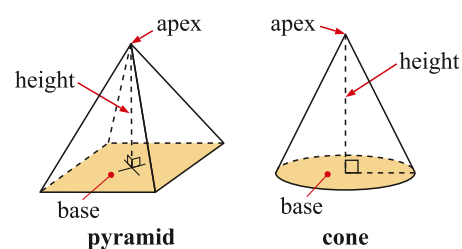
Mathematics: Core Topics HL p172

SL Mathematics Textbooks



Core Topics SL

- First of two books required for the completion of either of the SL Mathematics courses.
- Covers the content common to both SL courses.
- Background knowledge chapters available online for those who want to ensure they have the prerequisite levels of understanding.



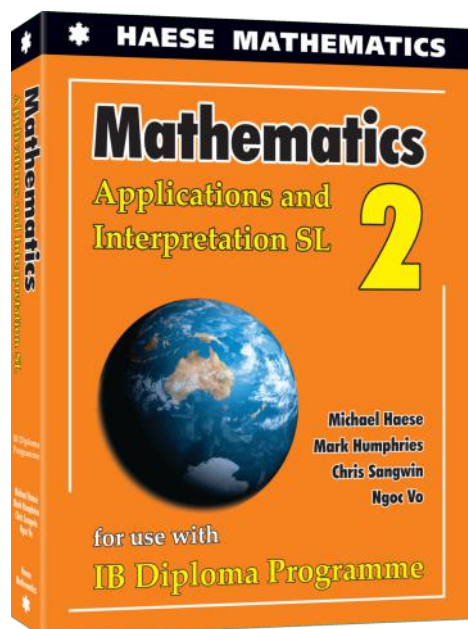
From Mathematics: Core Topics SL p158

Published 2019

Pages 388

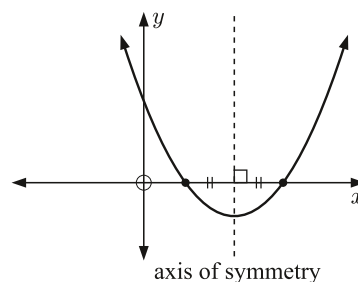
ISBN 978-1-925489-55-2

e-ISBN 978-1-925489-67-5



Applications and Interpretation SL

- Completes the Mathematics: applications and interpretation SL course, which is similar to the current Mathematical Studies SL course.
- Where appropriate, calculator screenshots and instructions are provided to help students use technology to solve problems.
- Algebraic approach sometimes included for completeness and to enhance understanding.



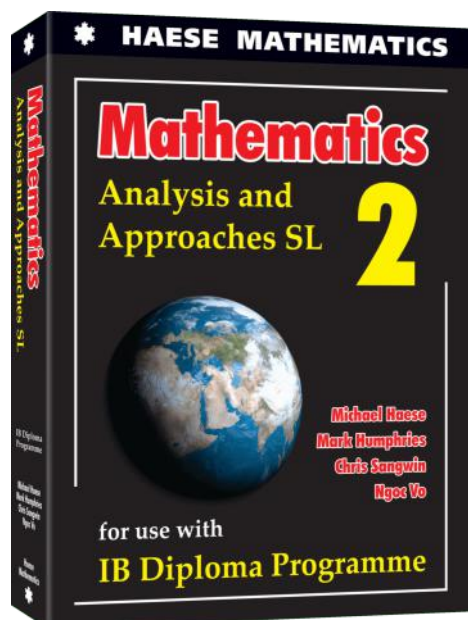
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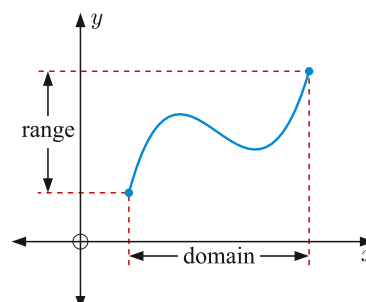
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Analysis and Approaches SL

- Completes the Mathematics: analysis and approaches SL course, which is similar to the current Mathematics SL course.
- Has a focus on algebraic rigour.
- Well graded exercises to develop conceptual understanding.



From Mathematics: Analysis and Approaches SL p72

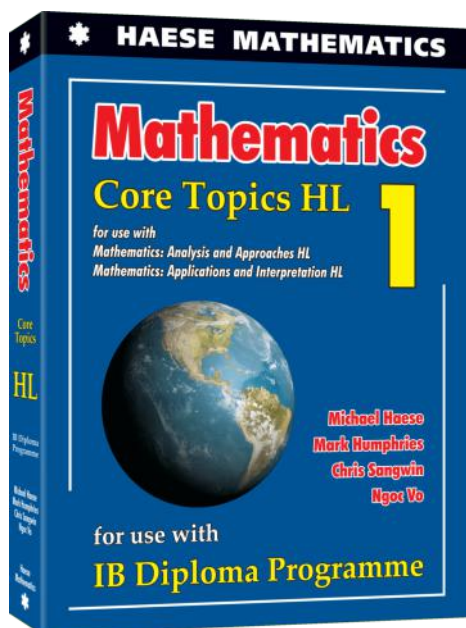
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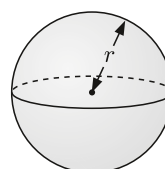
HL Mathematics Textbooks



Core Topics HL

- First of two books required for the completion of either of the HL Mathematics courses.
- Covers the content common to both HL courses.
- Contains more difficult questions and fewer basic questions to better prepare HL students.
- Includes contextual Activities and Investigations to promote subject richness.

Sphere



$$A = 4\pi r^2$$

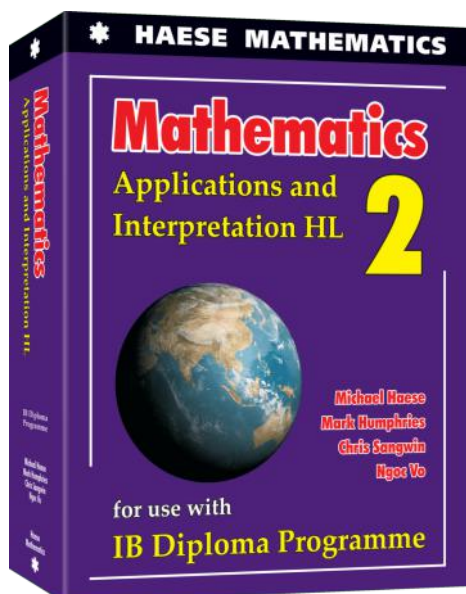
From Mathematics: Core Topics HL
p158

Published 2019

Pages 548

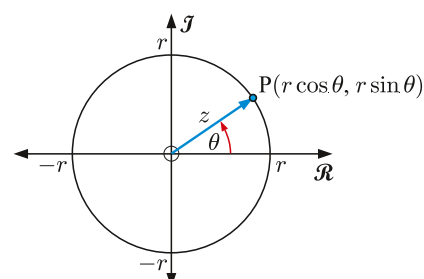
ISBN 978-1-925489-58-3

e-ISBN 978-1-925489-70-5



Applications and Interpretation HL

- Completes the Mathematics: applications and interpretation HL course.
- Explanations encourage conceptual understanding, and guide students to technological or algebraic solutions as appropriate.
- Questions are rooted in real-world contexts, so students can see the applications of their work.



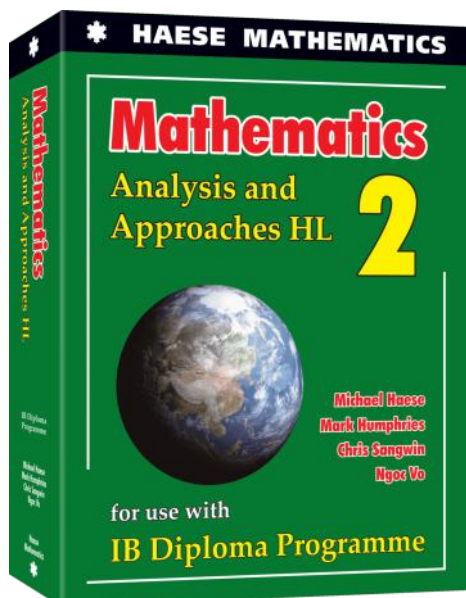
From Mathematics: Application and
Interpretation HL p282

Published 2019

Pages 968

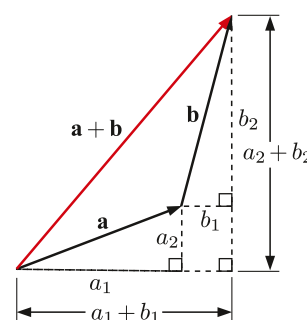
ISBN 978-1-925489-60-6

e-ISBN 978-1-925489-72-9



Analysis and Approaches HL

- Completes the Mathematics: analysis and approaches HL course, which is similar to the current Mathematics HL course.
- Has a focus on algebraic rigour and aimed at the strongest students.
- Challenging questions, Activities and Investigations aim to extend the most able HL student.



From Mathematics: Analysis and
Approaches HL p72

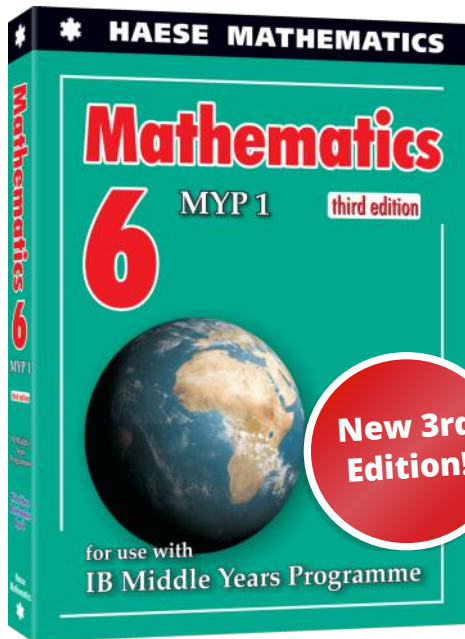
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Middle Years Programme



Mathematics 6 (MYP 1)

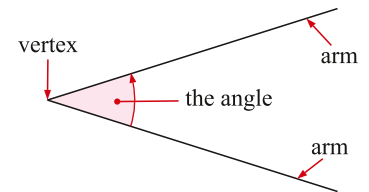
- Designed and written for the IB MYP Mathematics framework.
- Material presented in a clear, easy-to-follow style to aid comprehension and retention, especially for English Language Learners.
- Digital Snowflake subscription which supports textbook content with interactive and engaging resources such as Global Context projects.

Published 2021

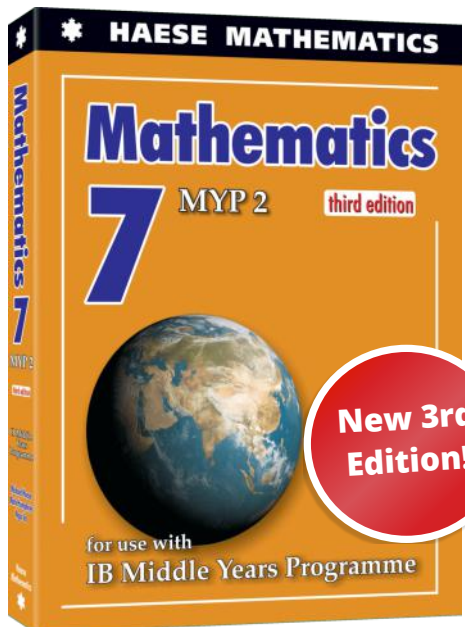
Pages 400

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e-ISBN 978-1-922416-29-2



From Mathematics 6 p45



Mathematics 7 (MYP 2)

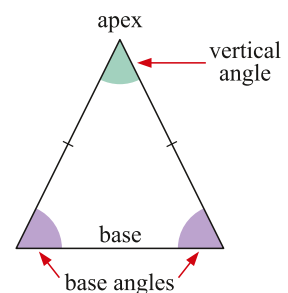
- Discussions, Activities, Investigations, and Research exercises are used throughout chapters to develop understanding.
- Each chapter ends with a review set and an online multiple choice quiz.
- Included digital Snowflake subscription contains additional learning resources as well as the textbook content.

Published 2021

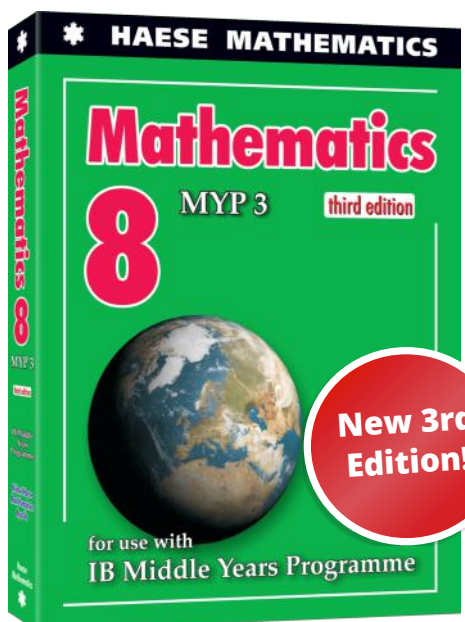
Pages 436

ISBN 978-1-922416-30-8

e-ISBN 978-1-922416-31-5



From Mathematics 7 p232



Mathematics 8 (MYP 3)

- Builds on the foundation developed by Mathematics 6 and Mathematics 7, for the IB MYP.
- Stimulating and thorough coverage of mathematical concepts in both the printed textbook, and digital Snowflake subscription.
- Global Context projects highlighting the use of mathematics in understanding other subject areas.

Published 2021

Pages 496

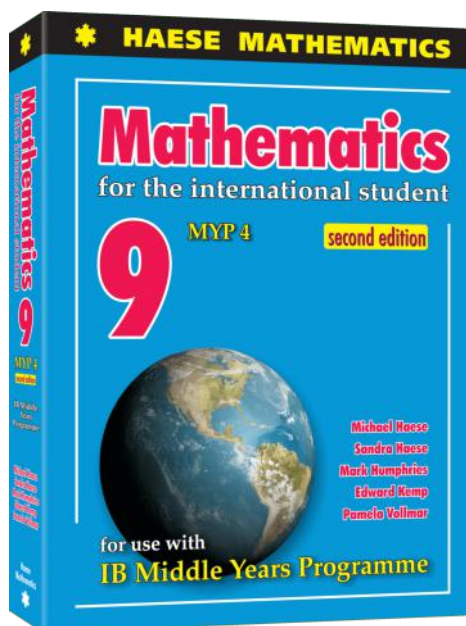
ISBN 978-1-922416-32-2

e-ISBN 978-1-922416-33-9

$$\begin{array}{c}
 \text{expansion} \\
 \curvearrowright \\
 3(x + 2) = 3x + 6 \\
 \curvearrowleft \\
 \text{factorisation}
 \end{array}$$

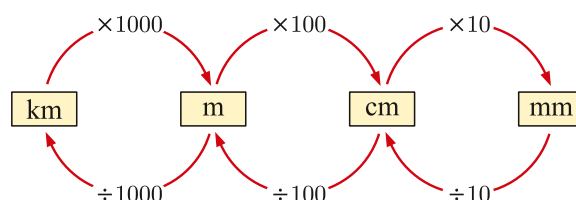
From Mathematics 8 p132

Middle Years Programme



Mathematics 9 (MYP 4)

- Textbook and interactive software provide an engaging and structured package.
- Allows students to explore and develop their confidence in mathematics.
- Contains a variety of exercises, ranging from basic to advanced, to cater for a range of students abilities and interests.



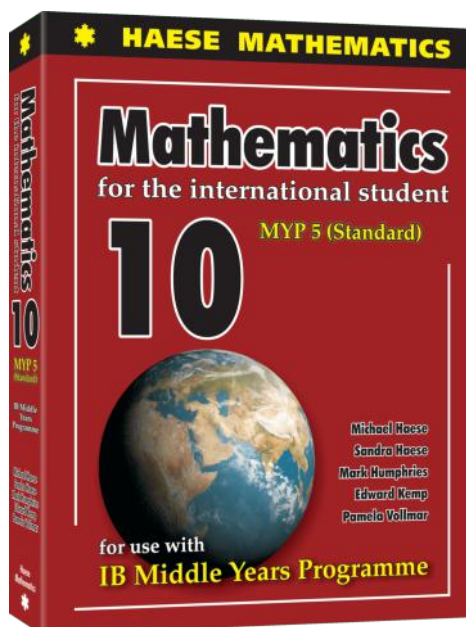
Published 2014

Pages 560

ISBN 978-1-921972-49-2

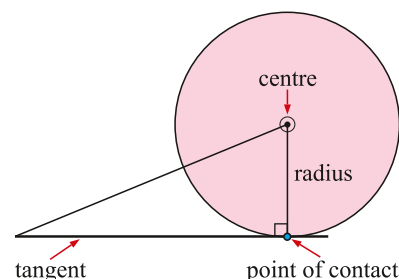
e-ISBN 978-1-921972-50-8

From Mathematics 9 p114



Mathematics 10 (MYP 5 Standard)

- Developed for students who are preparing to study mathematics at a standard level for their final years of secondary education.
- Follows the same detailed structure of the MYP series, presenting concepts and questions in a clear manner.
- Additional interactive digital resources are included in the Snowflake subscription.



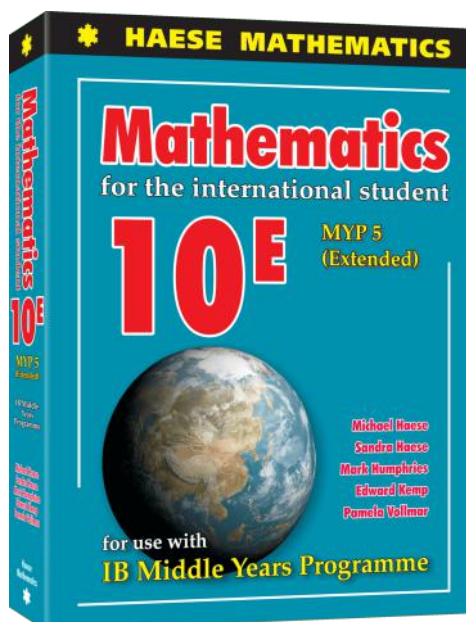
Published 2014

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ISBN 978-1-921972-51-5

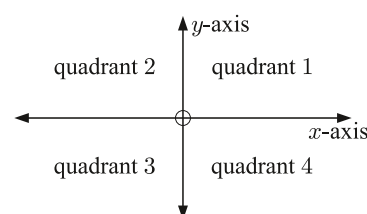
e-ISBN 978-1-921972-52-2

From Mathematics 10 p107



Mathematics 10E (MYP 5 Extended)

- Designed to prepare students planning to study Mathematics Higher level for their IB Diploma Programme Mathematics, or other rigorous courses.
- Covers the Extended content as outline in the MYP Mathematics framework, with additional extension topics.
- Discussions, Activities, Investigations, Puzzles, and Research exercises are used throughout the chapters to develop understanding, problem solving, and reasoning, within an interactive environment.



Published 2014

Pages 616

ISBN 978-1-921972-53-9

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From Mathematics 10E p104



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Dashboard



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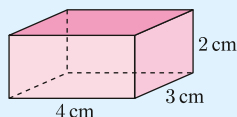
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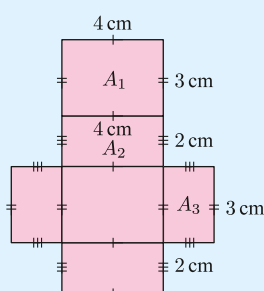
Example 1

Find the total surface area of the rectangular box:



Self Tutor

We first draw a net of the box:



$$\begin{aligned} A_1 &= 4 \times 3 = 12 \text{ cm}^2 \quad \{\text{bottom and top}\} \\ A_2 &= 4 \times 2 = 8 \text{ cm}^2 \quad \{\text{front and back}\} \\ A_3 &= 2 \times 3 = 6 \text{ cm}^2 \quad \{\text{sides}\} \end{aligned}$$

$$\begin{aligned} \therefore \text{total surface area} &= 2 \times A_1 + 2 \times A_2 + 2 \times A_3 \\ &= (2 \times 12 + 2 \times 8 + 2 \times 6) \text{ cm}^2 \\ &= 52 \text{ cm}^2 \end{aligned}$$

So, the total surface area of the box is 52 cm^2 .

Simply click on the icon, or anywhere in the example box, to activate a video explaining each step necessary to reach the answer.



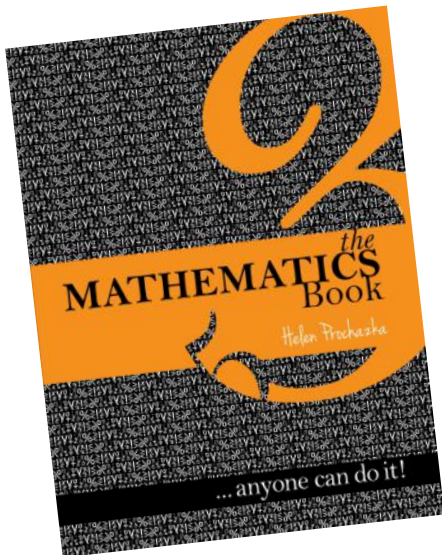
From
MYP3
page 256

The Mathematics Book

Distributed by Haese Mathematics



Published by Zenolith and distributed by Haese Mathematics, The Mathematics Book is a beautifully illustrated, how-to-do-it book especially created for adults and teenagers who have not found mathematics easy or appealing.



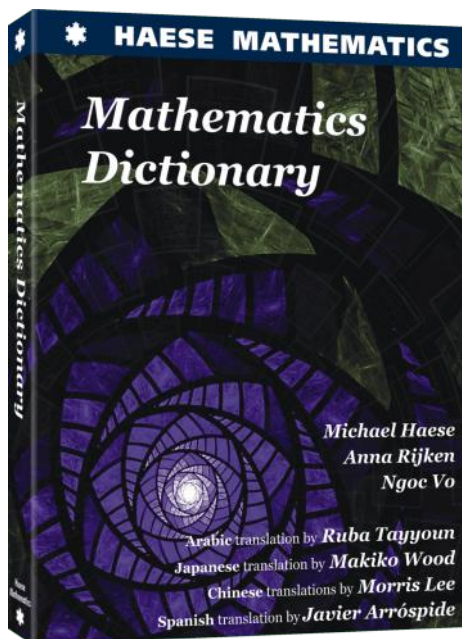
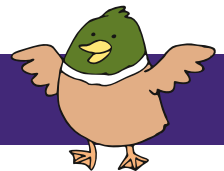
- Shows that mathematics can be beautiful, lighthearted, and fascinating
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- Poetry, quotes, cartoons, and hundreds of illustrations enhance and clarify the key ideas
- Illustrates mathematics in history, art, and culture
- A practical mathematics course in line with adult numeracy standards

Published 2016

Pages 376

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Mathematics Dictionary

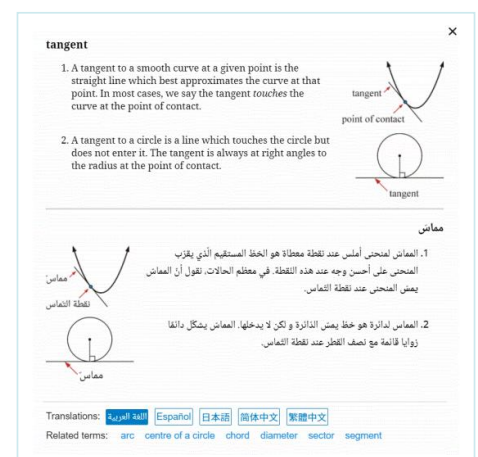


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- Spanish

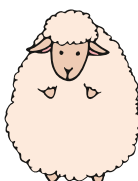


Mathematics Dictionary
Topic: Tangent

Published 2019

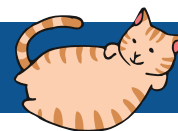
e-ISBN 978-1-925489-81-1

Online only!



Click on the keyword anywhere in the textbook to access the mathematics dictionary. It contains a complete explanation including diagrams.

Meet the Authors



Michael Haese

Michael completed a Bachelor of Science at the University of Adelaide, majoring in Infection and

Immunity, and Applied Mathematics. He studied laminar heat flow as part of his Honours in Applied Mathematics, and finished a PhD in high speed fluid flows in 2001. He has been the principal editor for Haese Mathematics since 2008.



Sandra Haese

Sandra completed a Bachelor of Science at the University of Adelaide, majoring in Pure

Mathematics and Statistics. She taught at Underdale High School and Westminster School before founding Haese and Harris Publications (now Haese Mathematics), together with husband Robert (Bob) and colleague Kim Harris.



Mark Humphries

Mark has a Bachelor of Science (Honours), majoring in Pure Mathematics, and a

Bachelor of Economics, both of which were completed at the University of Adelaide. He studied public key cryptography for his Honours in Pure Mathematics. He started with the company in 2006, and is currently the writing manager for Haese Mathematics.



Ngoc Vo

Ngoc Vo completed a Bachelor of Mathematical Sciences at the University of Adelaide, majoring in

Statistics and Applied Mathematics. Her Mathematical interests include regression analysis, Bayesian statistics, and statistical computing. Ngoc has been working at Haese Mathematics as a proof reader and writer since 2016.



Chris Sangwin

Chris completed a BA in Mathematics at the University of Oxford, and an MSc and PhD in

Mathematics at the University of Bath. He spent thirteen years in the Mathematics Department at the University of Birmingham. He is a Senior Lecturer in Mathematics Education at the University of Edinburgh.

Special Mention

A special mention to the following for their valued assistance with the editorial review of our new IB Diploma textbooks.

- Hiro Komaki at K. International School, Tokyo
- Denes Tilistyak of Western International School, Shanghai

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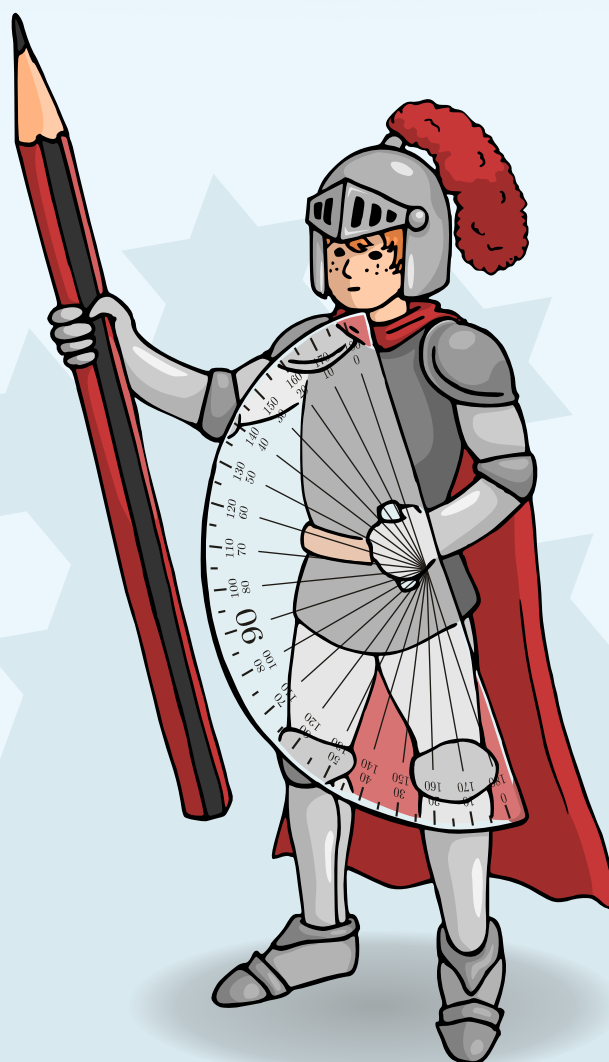
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Continually driven by the commitment to the education of young people, our in-house team of dedicated mathematicians, led by Michael Haese, work hard to ensure that our books are the most accurate and consistent books available.



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