

Subject – Math (Standard Level)
Topic – Vector
Year – Nov 2011 – Nov 2017
Paper- 1

Question 1

- (a) (i) evidence of approach (M1)
e.g. $PQ = OQ - OP$
- $$PQ = \begin{pmatrix} 2 \\ 1 \\ -4 \end{pmatrix} \quad \text{A1} \quad \text{N2}$$
- (ii) any correct equation in the form $r = a + sb$ (accept any parameter for s)
where a is $\begin{pmatrix} 2 \\ 4 \\ 8 \end{pmatrix}$ or $\begin{pmatrix} 4 \\ 5 \\ 4 \end{pmatrix}$, and b is a scalar multiple of $\begin{pmatrix} 2 \\ 1 \\ -4 \end{pmatrix}$ A2 N2
- e.g. $r = \begin{pmatrix} 2 \\ 4 \\ 8 \end{pmatrix} + s \begin{pmatrix} 2 \\ 1 \\ -4 \end{pmatrix}$, $r = \begin{pmatrix} 4 + 2s \\ 5 + 1s \\ 4 - 4s \end{pmatrix}$, $r = 2i + 4j + 8k + s(2i + 1j - 4k)$
- Note: Award A1 for the form $a + sb$, A1 for $L = a + sb$, A0 for $r = b + sa$.
- [4 marks]
- (b) (i) choosing correct direction vectors for L_1 and L_2 (A1)(A1)
e.g. $\begin{pmatrix} 2 \\ 1 \\ -4 \end{pmatrix}$, $\begin{pmatrix} 3p \\ 2p \\ 4 \end{pmatrix}$
- evidence of equating scalar product to 0 (M1)
correct calculation of scalar product A1
e.g. $2 \times 3p + 1 \times 2p + (-4) \times 4$, $8p - 16 = 0$
- $p = 2$ A1 N2
- (ii) any correct expression in the form $r = a + sb$ (accept any parameter for s)
where a is $\begin{pmatrix} 10 \\ 6 \\ -40 \end{pmatrix}$, and b is a scalar multiple of $\begin{pmatrix} 6 \\ 4 \\ 4 \end{pmatrix}$ A2 N2
- e.g. $r = \begin{pmatrix} 10 \\ 6 \\ -40 \end{pmatrix} + s \begin{pmatrix} 6 \\ 4 \\ 4 \end{pmatrix}$, $r = \begin{pmatrix} 10 + 6s \\ 6 + 4s \\ -40 + 4s \end{pmatrix}$, $r = 10i + 6j - 40k + s(6i + 4j + 4k)$
- Note: Award A1 for the form $a + sb$, A1 for $L = a + sb$ (unless they have been penalised for $L = a + sb$ in part (a)), A0 for $r = b + sa$.
- [7 marks]

Math Sl Paper 1 2011 Answer Key

Ensheng Dong



Math SI Paper 1 2011 Answer Key:

More Trouble with Maths Steve Chinn, 2020-03-24 Now in an updated third edition this invaluable resource takes a practical and accessible approach to identifying and diagnosing many of the factors that contribute to mathematical learning difficulties and dyscalculia Using a combination of formative and summative approaches it provides a range of norm referenced standardised tests and diagnostic activities each designed to reveal common error patterns and misconceptions in order to form a basis for intervention Revised to reflect developments in the understanding of learning difficulties in mathematics the book gives a diagnostic overview of a range of challenges to mathematical learning including difficulties in grasping and retaining facts problems with mathematics vocabulary and maths anxiety Key features of this book include Photocopiable tests and activities designed to be presented in a low stress way Guidance on the interpretation of data allowing diagnosis and assessment to become integrated into everyday teaching Sample reports showing the diagnostic tests in practice Drawing on tried and tested methods as well as the author's extensive experience and expertise this book is written in an engaging and user friendly style It is a vital resource for anyone who wants to accurately identify the depth and nature of mathematical learning difficulties and dyscalculia

Computational Geomechanics and Hydraulic Structures Sheng-Hong Chen, 2018-06-21 This book presents recent research into developing and applying computational tools to estimate the performance and safety of hydraulic structures from the planning and construction stage to the service period Based on the results of a close collaboration between the author and his colleagues friends students and field engineers it shows how to achieve a good correlation between numerical computation and the actual in situ behavior of hydraulic structures The book's heuristic and visualized style disseminates the philosophy and road map as well as the findings of the research The chapters reflect the various aspects of the three typical and practical methods the finite element method the block element method the composite element method that the author has been working on and made essential contributions to since the 1980s This book is an advanced continuation of Hydraulic Structures by the same author published by Springer in 2015

Proceedings of IAC-MEM 2015 collective of authors, 2015-07-05

Early Childhood Special Education Programs and Practices Karin Fisher, Kate Zimmer, 2024-06-01 Early Childhood Special Education Programs and Practices is a special education textbook that prepares pre and in service teachers with the knowledge skills and dispositions to deliver evidence based instruction to promote positive academic and behavioral outcomes for young children prekindergarten through second grade with development delays and or disabilities Early Childhood Special Education Programs and Practices intertwines inclusive early childhood practices by using real life anecdotes to illustrate evidence based practices EBPs and procedures The authors experts in their fields emphasize high leverage practices EBPs and culturally sustaining pedagogy and align them with the practices skills and competencies recommended by the Council for Exceptional Children's Division for Early Childhood Families administrators and teacher educators of pre and in service early childhood special education

and general early childhood education programs alike will find this book useful Included in Early Childhood Special Education Programs and Practices are An overview of early childhood and development of children ages 4 to 8 Strategies for relationship building with students families communities and school personnel Tips on creating a caring and positive classroom environment Chapters devoted to evidence based instruction in core subjects of reading and writing mathematics science and social studies for students with disabilities in pre K to second grade More than 80 images photos tables graphs and case studies to illustrate recommended Practices Also included with the text are online supplemental materials for faculty use in the classroom consisting of an Instructor s Manual and PowerPoint slides Created with the needs of early childhood special educators in mind Early Childhood Special Education Programs and Practices provides pre and in service teachers with the skills and practices they need to serve young children their families and communities across settings

Gesture-Speech Integration: Combining Gesture and Speech to Create Understanding Naomi Sweller,Kazuki Sekine,Autumn Hostetter,2021-09-14 **Hiroshima Mathematical Journal** ,2012 Reviews in Operator Theory, 1980-86 Paul Richard Halmos,1989 **Journal of the Physical Society of Japan** ,2016 **Science Citation Index** ,1994 Vols for 1964 have guides and journal lists *Reviews in Global Analysis, 1980-86 as Printed in Mathematical Reviews* ,1988

Subject Guide to Books in Print ,1996 Workbook Answer Key - IB Diploma Math SL Eran Levin,2013-12-09 Answerkey to workbook IB Diploma Math SL part 1 Includes detailed solutions to all exercises More info and free material can be found at <http://ibmathworkbooks.webnode.es> The index of the book is CHAPTER 1 ALGEBRA1 1 Types of numbers1 2 Interval notation1 3 Rationalization1 4 Exponents and Logarithms1 5 Equations1 6 Equations with absolute value1 7 Binomial Theorem1 8 Sequences and SeriesCHAPTER 2 FUNCTIONS2 1 Introduction to functions2 2 Linear functions2 3 Quadratic Functions2 4 Transformations2 5 Simple Rational functions 2 6 Exponential functions 2 7 Logarithmic functions 2 8 Radical functions 2 9 Piecewise functions2 10 Composite functions 2 11 Inverse functions CHAPTER 3 TRIGONOMETRY3 1 Degrees and Radians3 2 Definition of the Trigonometric functions3 3 Trigonometric functions3 4 Sine and Cosine Rule3 5 Trigonometric Ratios3 6 Inverse Trigonometric functions3 7 Trigonometric equations3 8 3D Geometry Workbook Answer Key - IB Diploma Math SL Studies Eran Levin,2013-09-24 Answer key to Workbook IB Diploma Math SL Studies Includes detailed solutions including graphs and diagrams to all exercises More info and free material can be found at <http://ibmathworkbooks.webnode.es> The index of the Answer key is as follows CHAPTER 1 ALGEBRA1 1 Types of numbers1 2 Interval notation1 3 Significant figures1 4 Scientific notation1 5 Error analysis 1 6 International system of units1 7 Currency conversion1 8 Sequences Series and compound interest1 9 Financial applications sequences series CHAPTER 2 STATISTICS2 1 Introduction to statistics2 2 Frequency diagrams and measures central t 2 3 Measures of dispersionCHAPTER 3 LOGIC3 1 Set theory 3 2 LogicCHAPTER 4 PROBABILITY4 1 ProbabilityCHAPTER 5 MATHEMATICAL MODELS5 1 Introduction to functions 5 2 Linear functions 5 3 Quadratic functions 5 4 Exponential functionsCHAPTER 6

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