EXAM PAPER

Specialist Mathematics Unit 1 & 2 — Practice Exam 2

PREVIEW
This file has the first 15 of the 30 questions in this paper. The rest is locked: it comes with a PrepNest plan, or with the paper itself for VCE.

Reading time: 15 minutes (no writing)
Writing time: 45 minutes
Total time: 60 minutes

SECTIONS IN THIS PAPER

- Specialist Mathematics — 45 min

INSTRUCTIONS

You are not permitted to write during reading time — you may only read the paper and plan your approach. Answer every question you can. Write your working in the space provided for long-answer questions. Marking guidance and full explanations are provided in the separate answer key.

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Specialist Mathematics

45 minutes

1. Find the modulus and argument of the complex number $z = 1 + i\sqrt{3}$, expressing the argument in degrees.

2. Explain what the complex conjugate of a number is, and describe the geometric relationship between a complex number and its conjugate on the Argand plane.

Question 3

What is a unit vector?

A. A vector with magnitude 0
B. A vector with magnitude 1
C. Any vector pointing along an axis
D. A vector with only whole-number components

Question 4

Given $a = (2, 3)$ and $b = (1, -1)$, find $a + b$.

A. (1, 4)
B. (3, 2)
C. (3, 4)
D. (1, 2)

Question 5

If $a = (3, 4)$, what is $2a$?

A. (3, 4)
B. (5, 6)
C. (6, 4)
D. (6, 8)

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Question 6
Find the dot product of u = (1, 2) and v = (3, 4).

A. 7
B. 11
C. 10
D. 14

Question 7
Two vectors are parallel if one is:

A. A scalar multiple of the other
B. Perpendicular to the other
C. Equal in magnitude only
D. Always the zero vector

Question 8
What is a position vector?

A. A vector with negative components only
B. A vector used only in 3D
C. A vector describing displacement from the origin to a point
D. A vector that changes direction over time

Question 9
Given a = (5, 2) and b = (3, 1), find a − b.

A. (8, 3)
B. (2, 3)
C. (−2, −1)
D. (2, 1)

Question 10
What is the magnitude of the 3D vector (1, 2, 2)?

A. 5
B. 3
C. 9
D. 2

Question 11
The dot product formula a·b = |a||b|cos(θ) can be used to find:

A. The magnitude of a alone
B. The angle between two vectors
C. Whether a vector is a unit vector
D. The sum of two vectors

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Question 12

What is true of the zero vector?

A. It has magnitude 1 and no defined direction

B. It is the same as a unit vector

C. It has magnitude 0 and no defined direction

D. It only exists in 3D space

13. Given vectors $a = (3, -2)$ and $b = (-1, 4)$, find $a + b$, $a - b$, and $2a$. Show your working.

14. Find the dot product of vectors $u = (2, 5)$ and $v = (-3, 4)$, and use it to determine whether the vectors are perpendicular. Show your working.

15. Find the magnitude of the vector $v = (5, -12)$, and hence find the unit vector in the direction of v. Show your working.

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30.

15 questions locked, up to question 30.

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PREVIEW

That’s the end of the preview

You’ve seen the first 15 of the 30 questions in Specialist Mathematics Unit 1 & 2 — Practice Exam 2. The full paper is worth 30 marks.

STILL TO COME	QUESTIONS	MARKS
Specialist Mathematics	15	15

The full paper comes with

- Every question, printed exactly like the ones in this preview
- The complete answer key, with the working behind every mark
- A topic report after marking, showing what to practice next

Get the full paper at

prepnest.com.au/practice/exams/specialist_maths-year_11-2

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