

# VCE Mathematical Methods

## Examination 1

### Question and Answer Book

- Reading time is 15 minutes
- Writing time is 1 hour

#### **Contents**

3 questions (11 marks)

### Question 1 (3 marks)

Let  $y = x^2 \cos(x)$ . Find  $(dy)/(dx)$ .

- a. Find the gradient of the tangent to  $y = f(x)$  at  $x = 8$ .

2 marks

## Question 2 (6 marks)

Let  $f : [0, 2\pi] \rightarrow \mathbb{R}$ ,  $f(x) = 2\cos(2x) - 1$ .

- a.** State the range of  $f$ . 1 mark
- b.** Solve  $f(x) = 0$  for  $x$ . 3 marks
- i.** Show your working. 2 marks
- ii.** Give exact values. 1 mark
- c.** Sketch the graph of  $y = f(x)$  for  $x$  in  $[(\pi)/2, (3\pi)/2]$ . 2 marks

**Question 3 (2 marks)**

Solve  $e^{2x} - 8e^x + 7 = 0$  for  $x$ .