

VCE Mathematical Methods Examination 1

Question and Answer Book

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

4 questions (13 marks)

Question 1 (3 marks)

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

a. (2 marks)

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

Question 2 (2 marks)

Let $g(x)$ be a function defined for $x \geq \frac{3}{2}$ so that $g'(x) = \frac{1}{2x - 3}$ and $g(1) = 0$.

Question 3 (6 marks)

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

a. (1 mark)

State the range of f .

b. (3 marks)

Solve $f(x) = 0$ for x .

i. (2 marks)

Show your working.

ii. (1 mark)

State exact values.

c. (2 marks)

Sketch the graph of $y = f(x)$.

Question 4 (2 marks)

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