Integration — free sample worksheet

Mathematics 9709 · Topic 1.8 · 20 marks

Answer every question. Show all your working — method marks are given for working even when the final answer is wrong. The levels go from easy to hard.

Question 1

EASY [3 marks]

Find $\int \left(\frac{2}{x^3} + \sqrt{x} \right) dx$.

Question 2

EASY [2 marks]

Find $\int (3x^2 - 4x + 5)\, dx$.

Question 3

MEDIUM [3 marks]

A curve has gradient $\frac{dy}{dx} = 3x^2 - 2$ and passes through the point $(1, 4)$. Find the equation of the curve.

Question 4

MEDIUM [3 marks]

Find $\int \frac{6}{(2x+1)^3}\,dx$.

Question 5

HARD [5 marks]

The curve $y = x^2 - 4x + 3$ crosses the x-axis at $x = 1$ and $x = 3$. Find the total area enclosed between the curve, the x-axis and the lines $x = 0$ and $x = 3$.

Question 6

HARD [4 marks]

The region bounded by the curve $y = \frac{3}{2x+1}$, the x-axis and the lines $x = 0$ and $x = 1$ is rotated through $360°$ about the x-axis. Find the exact volume of the solid formed.