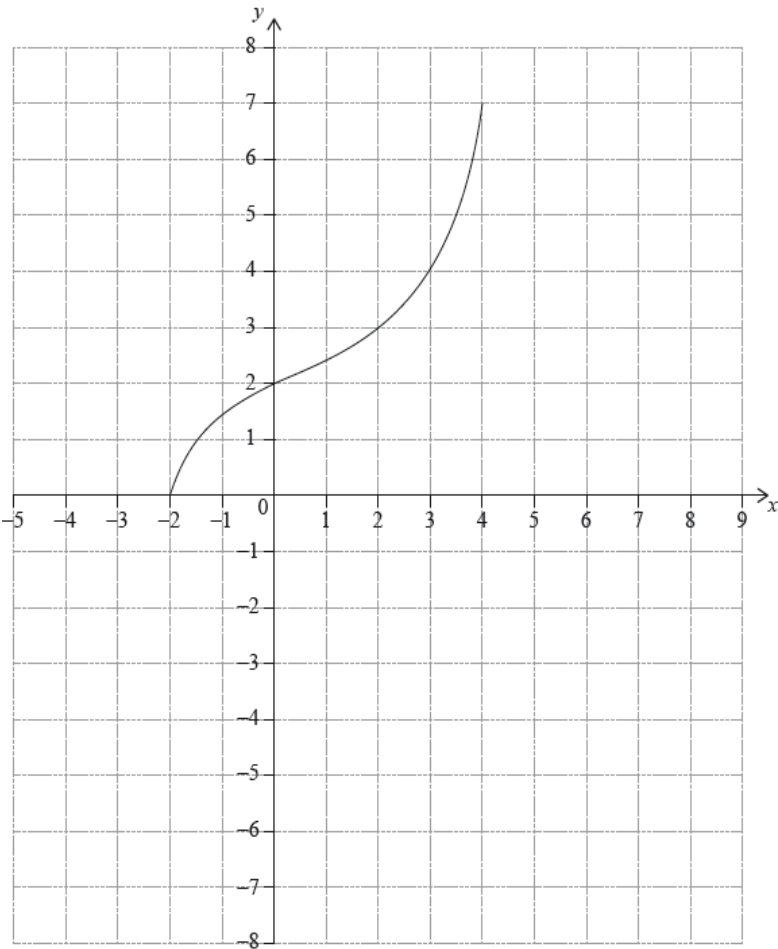


Chapter 2 [43 marks]

1. [3 marks]

The following diagram shows the graph of a function f , with domain $-2 \leq x \leq 4$.



The points $(-2, 0)$ and $(4, 7)$ lie on the graph of f .

On the grid above, sketch the graph of f^{-1} .

2. [3 marks]

Let $f(x) = (x - 5)^3$, for $x \in \mathbb{R}$.

Find $f^{-1}(x)$.

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3a. [2 marks]

The functions f and g are defined such that $f(x) = \frac{x+3}{4}$ and $g(x) = 8x + 5$.

Show that $(g \circ f)(x) = 2x + 11$.

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3b. [3 marks]

Given that $(g \circ f)^{-1}(a) = 4$, find the value of a .

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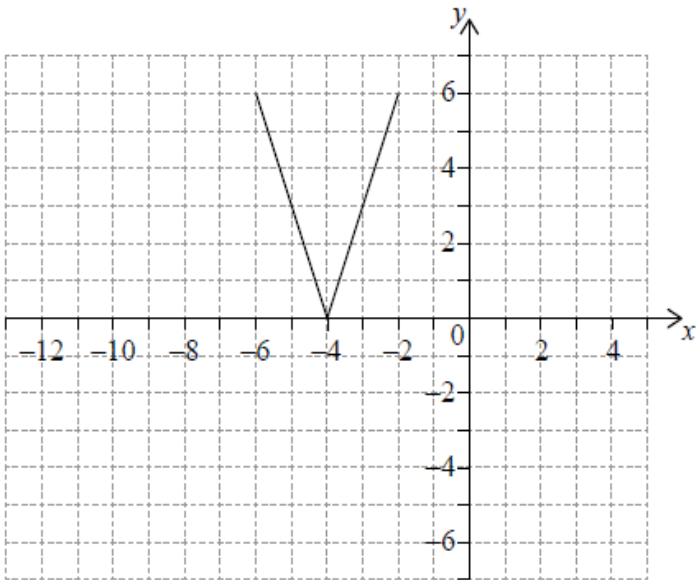
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4a. [2 marks]

The following diagram shows the graph of a function $y = f(x)$, for $-6 \leq x \leq -2$.
The points $(-6, 6)$ and $(-2, 6)$ lie on the graph of f . There is a minimum point at $(-4, 0)$.



Write down the range of f .

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4b. [2 marks]

Let $g(x) = f(x - 5)$.

Write down the domain of g .

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5a. [1 mark]

Consider the function $f(x) = \frac{1}{3}x^3 + \frac{3}{4}x^2 - x - 1$.

Write down the y -intercept of the graph of $y = f(x)$.

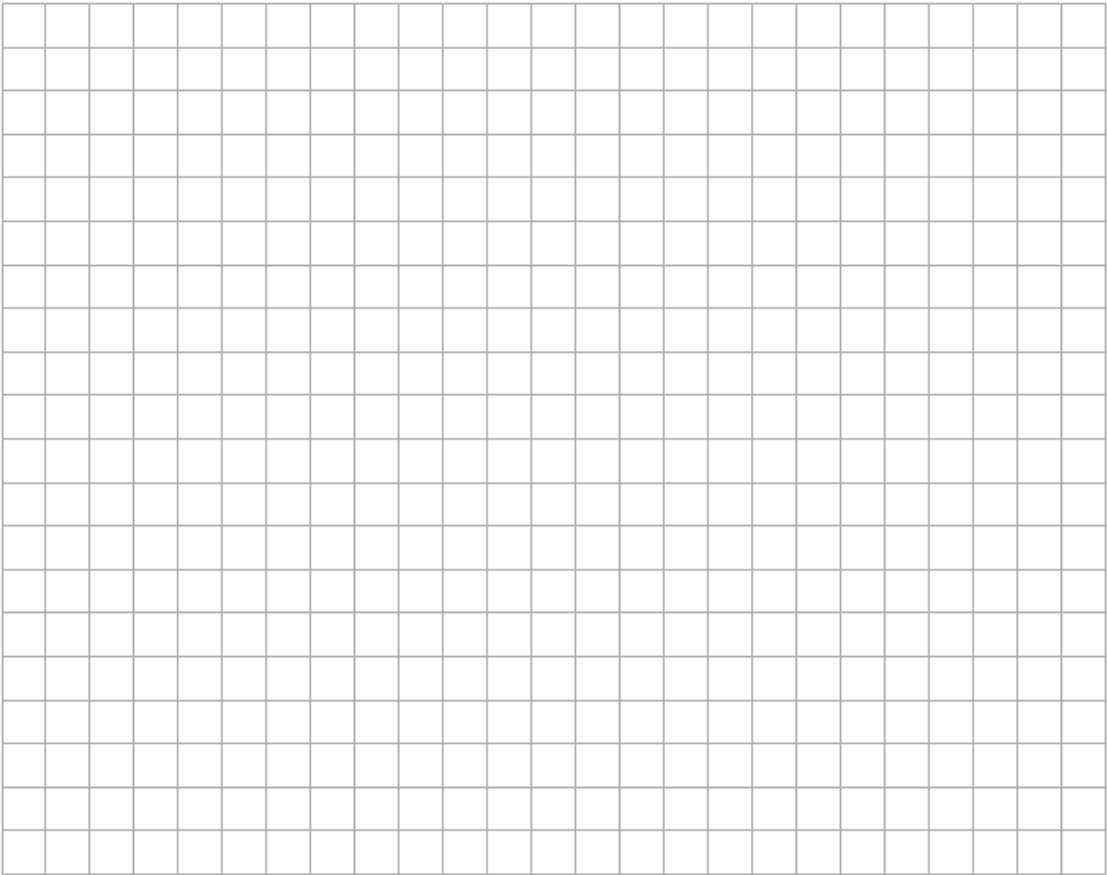
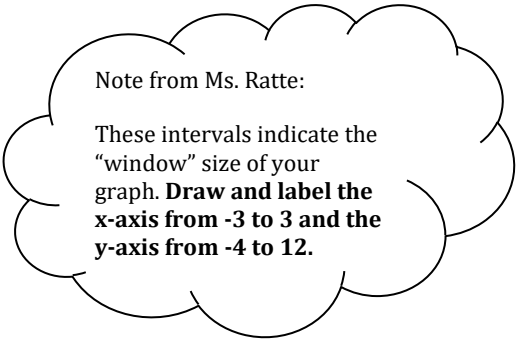
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5b. [4 marks]

Sketch the graph of $y = f(x)$ for $-3 \leq x \leq 3$ and $-4 \leq y \leq 12$.



5c. [3 marks]

The function has one local maximum at $x = p$ and one local minimum at $x = q$.

Determine the range of $f(x)$ for $p \leq x \leq q$.

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6a. [4 marks]

Consider the function $f(x) = \frac{1}{\sqrt{x}} - 1, \{x \in \mathbb{R} \mid x > 0\}$. Determine the exact value of $ff(0.01)$.

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6b. [3 marks]

Find an expression for $f^{-1}(x)$.

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6c. [2 marks]

State the domain and range of $f^{-1}(x)$.

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7a. [6 marks]

Find the value of a , given that $f(x) = \frac{4x-1}{2x+a}$ is a self-inverse function.

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7b. [2 marks]

Write down the domain for $f(x)$.

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7c. [3 marks]

Solve the equation $fff(x) = \frac{1}{4}$.

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