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Find  $f'(x)$

| Past Paper Question | C1 OCR January 2012 Q6

Given that  $f(x) = \frac{4}{x} - 3x + 2$ ,

(i) find  $f'(x)$ ,

(ii) find  $f''(\frac{1}{2})$ .

$$\begin{aligned} \text{i) } f(x) &= \frac{4}{x} - 3x + 2 \\ &= 4x^{-1} - 3x + 2 \\ \therefore f'(x) &= -4x^{-2} - 3 \\ &= -\frac{4}{x^2} - 3 \end{aligned}$$

$$\text{ii) } f'(x) = -4x^{-2} - 3$$

$$\therefore f''(x) = 8x^{-3}$$

$$= \frac{8}{x^3}$$

$$\therefore f''\left(\frac{1}{2}\right) = \frac{8}{\left(\frac{1}{2}\right)^3}$$

$$= \frac{8}{\frac{1}{8}}$$

$$= 64$$

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