(i) Use the definition of the definite integral in the form

$$\int_a^b f(x)\, dx = \lim_{n\to\infty} \sum_{i=1}^n f(x_i)\Delta x$$

to evaluate

$$\int_1^3 \left(3x^2 - 2x\right)\, dx$$

Carefully set up the Riemann sum and clearly show the steps of your simplification.

[8]

(ii) Now calculate $\int_1^3 \left(3x^2 - 2x\right)\, dx$ using the Fundamental Theorem of Calculus (Part 2) to check your answer in part (i).

[2]