Time: 20 minutes   Name: _____

Instructor: Dr. Edward Doolittle   Student #: _____

(marks)   Please do questions 1 and 2. You have 10 minutes to do each question, for a total of 20 minutes for the quiz. A calculator of the type mentioned in the course outline is allowed.

(10)   1. Express the limit $\lim\limits_{n\to\infty} \sum\limits_{i=1}^{n} \left(2x_i^* - 5(x_i^*)^2 + \sin(x_i^*)\right)\Delta x$ as a definite integral on the interval $[0, \pi]$. Do not attempt to evaluate the integral.

(10)   2. Evaluate the definite integral $\int_0^1 (x^3 + 2)\,dx$ from first principles, i.e., from the definition of a definite integral. You may find some of the following formulas helpful.

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2} \qquad \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6} \qquad \sum_{i=1}^{n} i^3 = \left(\frac{n(n+1)}{2}\right)^2$$