

MAT1001 Quiz 12 - Version 1
Time: 20 Minutes

Student Name: _____ Student ID: _____

1. [7+7=14 Points] Evaluate the following integrals.

(a) $\int \frac{16x^3}{4x^2 - 4x + 1} dx.$

(b) $\int_0^\infty \frac{1}{(1+x)\sqrt{x}} dx.$

2. [2 Points] Is the following statement true or false? No need to justify.
Simpson's rule over-estimates the integral

$$\int_1^2 (4x^3 - x^2 + \frac{x}{11} - 5) dx$$

with $\Delta x = 0.1$.

3. [4 Points] Let $I := \int_{-4}^{-3} xe^x dx$, and let T_n and M_n be the approximations of I using the trapezoidal rule and the midpoint rule, with n subintervals of equal length, respectively. Order the values of M_5 , T_5 and I from the smallest to the biggest. (No justification is required.)