Al-Imam University   26/10/2011

Calculus 2   MATH 102

Midterm 1

Duration: 1 hour 15 minutes.

Question 1. Use the appropriate integral technique to find the following integrals

a) $\int_1^4 \left(\sqrt{x} - \frac{2}{x} + 1 \right) dx$

b) $\int_{-1}^1 9x^2 \sqrt{x^3 + 1} \ dx$

c) $\int x^2 \ln x \ dx$

Question 2. Calculate the integral of the following rational function

$$\int \frac{x^3 - 2x^2}{x^2 - 3x - 4} \ dx$$

Question 3. Investigate the convergence or divergence of the following improper integral, and give its value if converges :

$$\int_1^{+\infty} \frac{3}{x^2} \ dx$$

Question 4. By using the trapezoidal method, with $n = 4$, give an approximation of :

$$\ln 2 = \int_1^2 \frac{1}{x} \, dx \ .$$