

SULTAN QABOOS UNIVERSITY  
DEPARTMENT OF MATHEMATICS AND STATISTICS

Math2108

Spring 2011

Quiz 3

Time: 20 minutes

Name:.....

Section: ..... Number:.....

**Q1: Circle ALL improper integrals in the following:**

*(4 points)*

(i)  $\int_{-1}^5 \frac{x}{x^2+x-6} dx$

(ii)  $\int_1^{1000} x^2 \ln(x) dx$

(iii)  $\int_1^{10} \csc(x) dx$

(iv)  $\int_{0.5}^{10} \frac{dx}{\ln(x)}$

(v)  $\int_1^5 \frac{x^2}{x-6} dx$

(vi)  $\int_1^\infty x \sin(x) dx$

**In questions 2 and 3, show your complete, mathematically correct and neatly written solution.** *(5+6 points)*

**Q2:** Test the integral  $\int_0^\infty 2xe^{-x^2} dx$  for convergence/divergence. If it is convergent, then find its value.

**Q3:** Evaluate the integral  $\int \frac{x+1}{x^2+4x+5} dx$ .

**Extra Credit Problem:**

*(2 points)*

Determine whether the integral  $\int_0^\infty \frac{1}{1+x^4} dx$  converges or diverges. Justify your answer.

**Good Luck**