Sultan Qaboos University
Department of Mathematics and Statistics

Math2108 Spring 2011

Quiz 2 Time: 20 minutes

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

Circle the choice that gives a BEST FIT for the answer in Question Q1 . *(3 marks)*

Q1: A student was asked to evaluate the integral $\int_{-2}^{0} x^4 e^{x^5}\, dx$. The student solved the question as follows:

$$\text{Let } u = x^5, \quad du = 5x^4\, dx \tag{1}$$

$$\int_{-2}^{0} x^4 e^{x^5}\, dx = \frac{1}{5}\int_{-2}^{0} e^u\, du \tag{2}$$

$$= \frac{1}{5}\left[e^u\right]_{-2}^{0} \tag{3}$$

$$= \frac{1}{5}\left[e^{x^5}\right]_{-2}^{0} \tag{4}$$

$$= \frac{1}{5}(1 - e^{-32}). \tag{5}$$

What can you say about the solution?

(a) The solution is correct.
(b) The answer is wrong.
(c) There is a mistake in Step (1).
(d) There is a mistake in steps (2) and (3).
(e) There is a mistake in Step (4).

In questions 2 and 3, show your complete, mathematically correct and neatly written solution.

Q2: Find $\int x \tan^{-1}(x)\, dx$. *(6 marks)*

Q3: Find the arc length of the curve of $y = \sqrt{1 - x^2}$, $0 \le x \le \frac{1}{\sqrt{2}}$. *(6 marks)*

Extra Credit Problem *(1 mark)*: Use Q3 to show that the circumference of the unit circle is 2π.

Good Luck