King Fahd University of Petroleum and Minerals
Quiz: 1 Math 102 Semester: 161 Duration: 45 minutes

Full Name: ID:
Serial number:

Question 1. (a) Use two rectangles and midpoints to approximate the area under the curve $y = 1 + \sin(x)\sin(2x)$ for $0 \leq x \leq \pi$. (b) Evaluate the area.

Question 2. A particle moves along a line so that its velocity at time t is $v(t) = -t(1-2t)^7$. Find the displacement by the particle during the time period $0 \leq t \leq 1$.

Question 3. Evaluate

a) $\displaystyle\lim_{n\to\infty} \frac{1}{n} \sum_{i=1}^{n} 3^{1+\frac{i}{2n}}$

b) $\displaystyle\int \frac{1}{3\,\mathrm{e}^{x} + \mathrm{e}^{-x}}\, dx$

Question 4. If

$$f(x) + \int_{2x-1}^{3-x} \mathrm{e}^{t^2}\, dt = 3x.$$

Find $f''(1)$.

Question 5. Evaluate (you may interpret the integral as an area)

$$\int_{-1}^{3} \sqrt{3 - x^2 + 2x}\, dx$$