

**The Islamic University Of Gaza**  
**Department of Mathematics**  
**Calculus A (Math A1401)**

**Date: 14/12/2003**

**Second Midterm Exam**

**Time: 60 Minutes**

	Q.1	Q.2	Q.3	Total
	14	22	14	50

**Answer the following questions:**

**Q.1 (a)** Find the linearization of  $f(x) = \sin(\pi x)$  at  $x = 1$ .

**(b)** Find  $\lim_{x \rightarrow \infty} \left[ x - \sqrt{x^2 - x + 1} \right]$

**Q.2** Let  $f(x) = 2x^4 - 8x^3 + 8x^2$ .

(a) Find the intervals on which  $f(x)$  is increasing and decreasing.

(b) Find the local extreme values of  $f(x)$ , if any.

(c) Find the intervals on which  $f(x)$  is concave up and concave down.

(d) Find the inflection points of  $f(x)$ , if any.

(e) Graph  $f(x)$ .

**Q.3** Evaluate the following integrals

(a)  $\int \frac{x+1}{\sqrt{x}} dx$

(b)  $\int x \cos^2(x^2 + 3) dx$