Quiz 4

MATH 1231 – Single-variable Calculus I

Summer 2016

Total Points: 10 **Total Time:** 15 minutes

Name: _____ **Date:** _____

Read all of the following information before starting the quiz:

- Show all work, clearly and in order, to get full credit. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- Do not use calculators.
- Circle or otherwise indicate your final answers.

1. Circle the correct answer (2 points)

   (a) Let g is defined by

$$g(x) = \int_{x^3}^{\sqrt{x}} \sin(t)\ dt$$

   Then, the derivative of g, $g'(x) =$

   i. $-\cos(\sqrt{x}) + \cos(x^3)$

   ii. $-\cos(\sqrt{x}).\frac{1}{2\sqrt{x}} + \cos(x^3).3x^2$

   iii. $\sin(\sqrt{x}) - \sin(x^3)$

   iv. $\sin(\sqrt{x}).\frac{1}{2\sqrt{x}} - \sin(x^3).3x^2$

   (b) $\int_3^5 (x^3 - 3\sin x)dx =$

   i.
$$\lim_{n\to\infty} \frac{1}{n} \sum_{i=1}^{n} \left[\left(\frac{i}{n}\right)^3 - 3\sin\left(\frac{i}{n}\right) \right]$$

   ii.
$$\lim_{n\to\infty} \frac{2}{n} \sum_{i=1}^{n} \left[\left(\frac{2i}{n}\right)^3 - 3\sin\left(\frac{2i}{n}\right) \right]$$

   iii.
$$\lim_{n\to\infty} \frac{2}{n} \sum_{i=3}^{5} \left[\left(\frac{2i}{n}\right)^3 - 3\sin\left(\frac{2i}{n}\right) \right]$$

   iv.
$$\lim_{n\to\infty} \frac{2}{n} \sum_{i=1}^{n} \left[\left(3 + \frac{2i}{n}\right)^3 - 3\sin\left(3 + \frac{2i}{n}\right) \right]$$

2. Find the following limit (4 points)

$$\lim_{n\to\infty} \frac{2}{n} \sum_{i=1}^{n} \left(\frac{2i}{n}\right)^2$$

3. Find the following indefinite integral with the substitution $y = 1 + \cos(t)$ (4 poitns)

$$\int \sin t \, \sqrt{1 + \cos t} \, dt$$