MTH 121 — Fall — 2004

Essex County College — Division of Mathematics

Test # 2[1] — Created December 5, 2004

Name: _____

Signature: _____

Show all work *clearly* and in *order*, and box your final answers. Justify your answers algebraically whenever possible. You have at most 80 minutes to take this 100 point exam. No cellular phones allowed.

1. Again, be patient as the second cup of LaTeX is being brewed. In any case, five questions in all, with this break down:

   (a) (10 points) — Find the absolute maximum and minimum value of a function on a closed interval.

   (b) (15 points) — Given given a, b, k, and $f(x)$, verify the following:

   $$\lim_{n\to\infty} \sum_{i=1}^{n} \left[\frac{b-a}{n} \cdot f\left(a + \frac{b-a}{n} i \right) \right] = k.$$

   (c) (15 points) — A word problem where you'll have to minimize or maximize a function.

   (d) (10 points) — You'll be given $f''(x)$, numerical information about $f(x)$, and you'll need to find $f(x)$.

   (e) (50 points total) — You'll be given simplified forms of $f(x)$, $f'(x)$, and $f''(x)$. And you'll need to answer:

      i. (6 points) — x-intercept(s):
      ii. (3 points) — y-intercept(s):
      iii. (3 points) — vertical asymptote(s):
      iv. (4 points) — horizontal asymptote(s):
      v. (4 points) — domain:
      vi. (5 points) — range:
      vii. (4 points) — local maximum(s):
      viii. (5 points) — local minimum(s):
      ix. (4 points) — global maximum(s):
      x. (5 points) — global minimum(s):
      xi. (7 points) — point(s) of inflection:

[1] This document was prepared by Ron Bannon using LaTeX.