Math2B - Practice Midterm 1

January 29, 2007

1. Express the following limit as a definite integral on the given interval and using the Fundamental Theory of Caculus to evaluate it.
   $\lim_{n\to\infty} \sum_{i=1}^{n}[4 - 3(x_i)^2 + 6(x_i)^5]\Delta x, [0, 1]$.

2. Using the substitution rule to evaluate the following indefinite integral (including the constant C is not required)
   $\int x^2(x^3 + 5)^9 dx$

3. Using the substitution rule to evaluate the following definite integral.
   $\int_1^2 x\sqrt{x-1}dx$.

4. Find the area of the region enclosed by the given curve (decide whether to integrate with respect to x or y).
   (1) $y = x, y = x^2$. (2) $x = 2y^2, x + y = 1$.

5. Find the volume of a solid obtained by rotating the region bounded by the given curves about the sepcified line.
   (1) $y = x$ and $y = x^2$ about y axis
   (2) $y = x$ and $y = x^2$ about $x = 2$.

6. Find the average value of $f(x) = 1 + x^3$ on the interval $[-1, 2]$.

7. Find a formula for the inverse of the function $y = 2x^3 + 3$.