

MAPLE PROJECT 4
Applications of the Integral

Due date May 1, 2006

Problem 1. Area: Find the area of the region in the first quadrant that lies below the curve

$$y = x + x^2 - x^3$$

and above the x-axis.

Problem 2. Area: Find a positive value of k such that the region in the first quadrant enclosed by $y = x^2$, $y = x^2/4$, and the horizontal lines $y = k$ and $y = k + 1$ has an area of 3 square units.

Problem 3. Consider the function $f(x) = x^3 - 2x^2 - 3x + 10$ on the interval $[-2, 3]$.

- (a) Calculate numerically the left, and right sums for $n=10$ and $n=100$.
- (b) Find the limit of the left sum as $n \rightarrow \infty$. Compare the area as found using “int” command.
- (c) Plot the graph of f and rectangles for its left and right sums for $n=20$ (in one graph)