

## MTH 131 FALL 2001

### Practice Problems for Exam 3

- Let be given the function  $f(x) = 2x^3 + 3x^2 - 36x + 25$ .
  - Find all critical points of  $f$ .
  - For each critical point found in (a), state whether it corresponds to a local minimum, a local maximum, or neither.
  - Find the inflection points of  $f$ .
- Let  $g$  be given by  $g(x) = 3x^4 - 4x^3 + 3$ .
  - Find all critical points of  $g$ .
  - For each critical point found in (a), state whether it corresponds to a local minimum, a local maximum, or neither.
  - Find the inflection points of  $g$ .
- A function  $f$  is defined by  $f(x) = ax^2 + bx - \ln(x^2 + 1)$ . If  $f(x)$  has a critical point at  $x = 0$ , and a inflection point at  $x = 3$ , find the values of  $a$  and  $b$ .
- The graph of  $f'(x)$  is given below. Find the critical points, the local minima, the local maxima and and the inflection points.(Note this is the graph of  $f'(x)$ , not  $f(x)$ )

5. The table below contains the values for  $f(x)$ . Estimate  $\int_0^{15} f(x)dx$

$x$	0	3	6	9	12	15
$f(x)$	50	48	44	36	24	8

6. # 27, page 189 in Textbook.

7. If  $f(x) = \sqrt{x}$ , then we know  $f'(x) = \frac{1}{2\sqrt{x}}$ . Find  $\int_1^4 \frac{1}{2\sqrt{x}} dx$  in two ways.

- Using your calculator.
- Using the Fundamental Theorem of Calculus.

8. Estimate the definite integral  $\int_2^4 \frac{1}{\sqrt{1+x^2}} dx$ , by computing the left-hand sum and the right-hand sum, and using 4 subdivisions.