

**MAT 141**  
**ASSIGNMENT 9**

DUE NOVEMBER 14, 2005

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Please write proofs (or at least some reasoning if you can't give a full proof), not just answers! So if a problem asks whether some set has a maximum, do not just write “No”, write “No, it doesn't because. . .”

As usual, you are allowed to use all the theorems stated in the appropriate chapters of the book (whether or not we have discussed them in class).

- (1) Let  $p(x) = x^n + a_1x^{n-1} + \cdots + a_n$ . Show that there exists  $A \in \mathbb{R}$  such that for all  $x > A$ ,  $p(x) > 0$ . [Hint: consider function  $f(t) = p(x)/x^n$ ,  $x = 1/t$  as  $t \rightarrow 0+$ .]
- (2) Section 3.8, problems 14, 18, 20
- (3) Section 3.11, problems 1, 2b, 5
- (4) Section 3.15, problems 2, 5
- (5) Section 3.20, problems 1, 7