

MTH 1210, FALL 2013
DR. GRAHAM-SQUIRE

SECTION 3.2: IN CLASS ACTIVITY
POLYNOMIAL FUNCTIONS AND THEIR GRAPHS

1. NAMES

2. INSTRUCTIONS

Read the problem given below, then work on it with the other members of your group. You should give a complete answer with all of your work shown for each question. It is fine for different people to work on different parts of the question, but you should check each other's work since everyone in the group will receive the same grade for the assignment. If you have any questions, ask the other members of your group first. If all of you are stuck, everyone in the group must raise their hand in order to get help from the professor. Attach this as a cover sheet to the work you turn in.

Exercise 1. A cardboard box has a square base, with each edge of the base having a length of x inches. Based on postal regulations, the sum of the dimensions of the box can be no more than 36 inches (that is, length + width + height = 36 if you want to make the largest box possible).

- (a) Draw a diagram of the box. Label the appropriate sides x .
- (b) Find an expression (in terms of x) for the maximum possible height of the box.
- (c) Use the answers above to construct a polynomial to represent $V(x)$ = the volume of the box.
- (d) What is the domain of V ? Note that negative length and negative volume do not make sense in this situation.
- (e) What are the zeroes of $V(x)$? What are their multiplicities?
- (f) Use a graphing utility to graph $V(x)$. Sketch the graph and use it to estimate (a) what dimensions would result in the maximum possible volume of the box, and (b) what that volume would be.