

**MTH 1210, FALL 2013**  
**DR. GRAHAM-SQUIRE**

SECTION 3.4: IN CLASS ACTIVITY

1. NAMES

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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.** An open box with a volume of  $1500 \text{ cm}^3$  is to be constructed by taking a piece of cardboard  $20 \text{ cm}$  by  $40 \text{ cm}$ , cutting squares of length  $x$  from each corner, and folding up the sides. Show that this can be done in two different ways and find the exact value of  $x$  in each case. Note that "exact" means that I do not just want a decimal approximation!

(a) Draw a diagram of the situation. Start with a  $20 \times 40$  rectangle, then show how the corners are cut out, then show how it is folded up into a box.

(b) Write an equation (in terms of  $x$ ) that represents the volume of box, and then move stuff to one side so that you have a polynomial equal to zero.

(c) Use graphing and/or factoring techniques to fully factor the polynomial you get from part (b) and find all the zeroes.