Homework 2: Due Friday February 10th in recitation. Homework not handed in on time is considered late and will not be accepted.

Write on only one side of each page. Staple all work.

1. Verify the following formulas

   (a) $A^3 - B^3 = (A - B)(A^2 + AB + B^2)$

   (b) $A^3 + B^3 = (A + B)(A^2 - AB + B^2)$

Remark: Note that we cannot factor the expressions $A^2 + AB + B^2$ and $A^2 - AB + B^2$ (at least not yet).

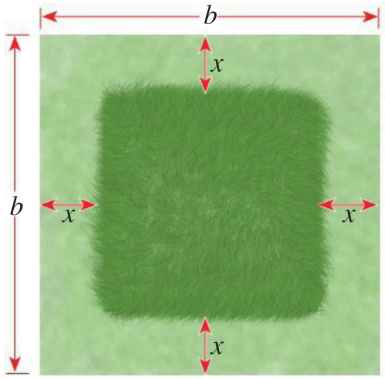
2. Factor the following expressions:

   (a) $A^4 - B^4$

   (b) $A^8 - B^8$

3. Factor $\frac{1}{2}x^{-1/2}(3x+4)^{1/2} - \frac{3}{2}x^{1/2}(3x+4)^{-1/2}$.

4. NYU is in the process of creating the "We Love Math" park. Only those who love math will be admitted. I know all of you will be admitted. The field has mowed edges, but the rest of the field is kept unmowed. The dimensions of the park are given below. Note that the mowed strip is the lighter shade of green.



Find the area of the mowed portion of the park. Note that your answer will be in terms of b and x.

5. Simplify the following expressions

   (a) $\frac{1}{1+\frac{1}{1+x}}$

   (b) $\frac{(x+h)^3 - x^3}{h}$.

   (c) $\frac{(7-3x)^{1/2} + \frac{3}{2}x(7-3x)^{-1/2}}{7-3x}$

6. When two electrical resistors with resistance R_1, R_2 are connected in parallel the total resistance R is given by

$$R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}$$

Solve for R_2.

7. Solve for x in the equations below:

1. $x^2 - 6x + 1 = 0$
2. $\frac{1}{x-1} - \frac{2}{x^2} = 0$
3. $5 = \sqrt{4x - 3}$