Mathematics 414, Problem Set #1
(due by 1:00, September 15)

Problem 1. A rectangle has area 110 cm^2 and perimeter 44 cm. If each side of the rectangle is expanded by 2 cm, what is the area of the expanded rectangle?

Problem 2. What is the smallest value taken on by $2x + 3/x$ as x ranges over the positive reals? No calculus, please. Hint: think maybe about minimizing $u + v$, subject to the condition $uv = 6$.

Problem 3. Let $x = 2000 - \sqrt{999999} - \sqrt{1000001}$. Evaluate x (in "scientific" notation), correct to (a) 3 significant figures and (b) 15 significant figures. Do the evaluation without a calculator, or with at most a simple scientific calculator.

Problem 4. "Invent" a problem whose solution involves ideas similar to those in the classical hares-pheasants problem, and give solutions appropriate for (Canadian) elementary school students.

Problem 5. "Invent" a not very hard grade 11–12 workshop problem, and write out a detailed solution for the use of someone giving a workshop. Take as source of inspiration some UBC workshop problem. Identify explicitly the problem you used.