1. (4 marks) Look at assignment 6 on the web site. You will see the answers for Workouts Question 34.1 organized into a table with rows. Create a table like this for question 34.2. I would recommend columns for $P_H$, $H$, honey producer profits, $P_A$, $A$, apple producer profits, and the subsidy to the honey producers.

2. Question 34.4 is particularly important because it shows the importance of property rights in resolving externality problems. Whatever the endowment of property rights, there are gains from trade for each of Tom and Jerry, but where they end up is very heavily influenced by the endowment of property rights — does Tom have the right to play music at any time and at any volume, or does Jerry have the right to a quiet room? The history of smoking is a good example of changing property rights. When I started teaching at McMaster you could smoke in the classroom, then only in your office, then only outside the building, then only at a distance of several feet from one exit of each building. And, now, the entire campus is smoke free. In the following question some of the Pareto efficient allocations are tangencies of indifference curves and some are intersections of indifference curves on the boundary of the Edgeworth rectangle.

(3 marks for each part) Ed and Fiona live together. Ed likes to smoke cigarettes in the house; Fiona dislikes cigarette smoke. Their utility functions are:

\begin{align*}
    u^E (m^E, c) &= m^E - (10 - c)^2 \\
    u^F (m^F, c) &= m^F - c^2,
\end{align*}

where $m$ is dollars spent on private goods per day and $c$ is the number of cigarettes smoked in the house by Ed per day. Assume Ed and Fiona each have 40 dollars to spend per day.
and cigarettes are free. As precisely as you can, describe the Pareto-efficient allocations in two settings: (a) Ed has the right to smoke as much as he likes in the house; (b) Fiona has the right to prevent Ed from smoking in the house.

3. (2 marks for each part) Assume that everybody in New Liskeard, with population \( n + 1, n \geq 1000 \), is just like everyone else. Everybody likes to drive around town but nobody likes the resulting noise, pollution and traffic congestion. Each resident’s utility function is

\[
U(m, d, h) = m + ad - d^2 - bh/n, \quad a > b > 0
\]

where \( m \) is the number of Big Macs consumed per day, \( d \) is the number of hours per day that each person drives, \( h \) is the total number of hours driven by all other citizens, and \( a \) and \( b \) are parameters of the utility function. In addition, suppose the price of a Big Mac is 1 dollar, everyone has an income of \( y > ab \) dollars per day and it costs nothing to drive.

(a) Find \( U \) in the private equilibrium as a function of \( a, b, y \).

(b) Find the tax rate, \( t \), measured in dollars per hour of driving that the government would have to levy to maximize the utility of each resident. Note that \( t \) will depend on at least one of \( a, b \) and \( y \).