-Due in Thursday lecture of week 12-

INSTRUCTION: All homework must have a title page with your name, student number, TA, and tutorial group

*** you will lose 25% for failing to follow instructions ***

[1] A perfectly competitive constant cost industry contains a number of firms, each of which has the following long-run total cost function, where q is annual output:

$$LTC = .01q^3 - 1.2q^2 + 111q$$

The market demand curve for the product is:
$Q = 6,000 - 20P$, where Q is annual industry sales.
(a) Calculate the long-run equilibrium output of the industry
(b) How many firms are in the industry in long-run equilibrium?
(c) The government decides to reduce the number of firms in the industry to 60 and sells 60 licences annually by competitive tender. The number firms is thereby fixed at 60, but the licensed firms continue to compete competitively. A new equilibrium is achieved.
    (i) What is the new price of the product?
    (ii) What is the competitive equilibrium price of an annual licence?

[2] Each firm in a perfectly competitive constant-cost industry has the following long-run cost function: $LTC = q^3 - 50q^2 + 750q$ where q is the firm's daily output, measured in tons, and costs are expressed in dollars. The market demand curve for the product is $Q = 2,000 - 4P$, where Q is total industry sales per day, in tons, and P is the price per ton.
(a) derive the long-run supply curve for the industry.
(b) how many firms are there in the industry in long run equilibrium?
(c)A sales tax of 20% of the market price is imposed on the product. How many firms will there now be in long-run equilibrium?
(d) The sales tax is repealed and replaced by a $50 per ton excise tax. How many firms will be in the new long-run equilibrium?
(e) All taxes are repealed and the industry returns to the equilibrium in (b). The government now pays a subsidy of $*S* per ton to producers. As a consequence the number of firms in the industry increases by three. How much is the subsidy per ton?

[3] From the textbook:

chapter 10: #3, #9

chapter 11: #1 (note: for this question you must derive all results, do not use formulas from the chapter since they won't work)