1. Suppose that a monopoly hospital faces the following demand curve:

\[ P = 490 - 2Q, \text{ and the following cost function} \]
\[ TC = 10Q \]

a. Calculate the monopoly’s profit maximizing price, quantity, and profit.

b. What would society’s optimal production be? Why?

c. Suppose that for a fixed cost investment of $500 per period, the monopolist could reduce marginal cost by $2 per unit. Sketch out a graphical depiction of this possibility.

d. Suppose now that the “yardstick” price facing the hospital was $8.50 per unit output. Sketch out in as much detail as possible the hospital yardstick optimization, using all of the information you have been given.
2. Athelstan and Bathsheba are allocated the economy’s total production of Spam S and medical visits V, as drawn. Each is allocated $\frac{V}{2}$ visits, at the outset. Their contract curve is the solid curved line.

- Analyze this allocation in terms of economic equity.
- Analyze this allocation in terms of economic efficiency.
- If Athelstan and Bathsheba are allowed to trade is the resulting trade likely to lead to an equitable allocation? Why or why not?
3. Goddeeris relates technological change to payment for insurance. In this model, entrepreneurs seek extra profit $E$, subject to a health innovation frontier. Consider the following functional notation, where increased medical expenditures are $\Delta m$, and increased health is $\Delta h$.

Profit function:

$$E = \frac{\Delta h}{z} - \Delta m,$$

(I)

Health innovation frontier:

$$\Delta h = 0.2 + 0.5 \Delta m - (\Delta m)^2$$

(ii)

where $z$ is the coinsurance rate.

a. Consider function (ii). How does this function relate to the “standard” model (holding quantity or quality of output constant) of technological change? (Hint: Define constant output or constant quality in this framework).

b. Suppose that $z = 0.5$. Calculate equilibrium values $\Delta m$, $\Delta h$, and $E$.

c. What happens to $\Delta m$, $\Delta h$ and $E$ if $z$ falls to 0.1. Explain your answers carefully.
4. Consider the following demand curve for health care visits.

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- a. Calculate total expenditures at a price of $90.
- b. If a 33.3% coinsurance rate is imposed, calculate the new level of total expenditures. How much does the customer pay, and how much does the insurer pay?
- c. What is the increase in total benefits due to the imposition of coinsurance?
- d. Does the increase in total benefits constitute an increase in societal welfare? Why or why not?

5. Hospitals often face a quantity-quality trade-off.

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- a. Derive the quality-quantity trade-off in as much detail as necessary to provide a nice two dimensional diagram (but no more than that).
- b. Describe the equilibrium for a nonprofit hospital that cares only about the quality of care that it gives its clients.
- c. Within the context of the problem, thus far, contrast the behavior of a for-profit hospital with the nonprofit hospital described above.
6. Suppose that governmental policy-makers are concerned about the share of GDP $y$ (stated in nominal terms) that goes to health care $q$, with price $p$. You are brought in as a consultant and you estimate an economic model that suggests that the income elasticity of demand is +1.2, and the price elasticity of demand is –0.6.

a. Holding price constant what is likely to happen to the health care share as income rises? Why?

b. Suppose that income rises by 10% and health price also rises by 10%. What will happen to the health care share?

c. As a policy-maker, given these parameters, what would be the impact of downward pressure on health care prices on the health care expenditure share.