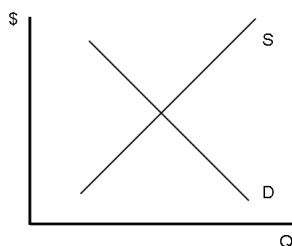1. (4 points) Start with aggregated supply and demand curves, such as these:

Show how (one or both) curves shift (in or out) and the new equilibrium.

(a) (2 points) The government decides to subsidize university education. Draw S-D curves for education and labor (define what's demand and what's supply) before and after the subsidy.

> **Solution:** The subsidy shift out the supply curve for education, which increases quantity demanded (it does not increase demand, as an income transfer would, because the subsidy ONLY lowers the cost of education). More university graduates means that the supply of university-educated labor shifts out, implying lower wages. (Prior, un-subsidized graduates will be displeased to see their wages drop due to competition from a larger cohort of subsidized graduates.)
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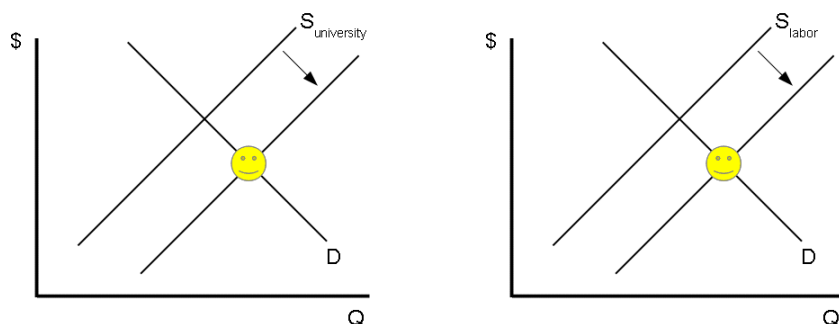
(b) (2 points) Markets for fiction books versus one economics textbook. Draw two different sets of S-D curves. Show *and discuss* relative elasticities.

> **Solution:** The market for fiction is elastic for supply and demand (many books, many readers with many choices). NB: a "steep" (inelastic) supply implies that quantity cannot increase at higher prices. Obviously it can, via printing or greater e-book downloads. Demand, likewise is elastic because *readers* have many choices. A single reader who loves fiction ("there are no substitutes") may have an inelastic demand curve, but we're talking "markets."
>
> The market for a single textbook is relatively inelastic on the demand side (students are typically the only buyers of a book they are required to purchase) and elastic on the supply side, as the publisher of the book can supply many copies at the (high) "official" price. I didn't make it flat (one price),

as there are sometimes used book markets. Many people forgot to discuss supply elasticity.
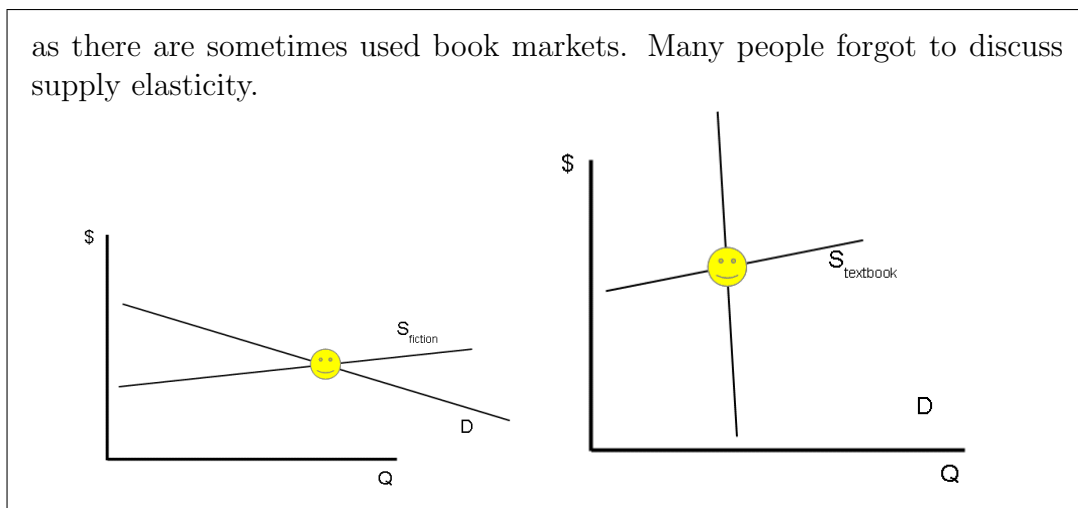
2. (4 points) A monopoly faces a direct demand curve of $Q = 2 - p$ and has a cost function of $c(Q) = \frac{1}{2}Q^2$.

   Write down the business' profit function $(TR - TC)$ and find its profit maximizing quantity, price and profits.

Solution: $\pi = TR - TC \rightarrow \pi = pQ - c(Q) = (2 - Q)Q - \frac{1}{2}Q^2$

Find the profit maximizing quantity via derivative wrt Q, i.e.,

$\frac{\delta\pi}{\delta Q} \rightarrow 2 - 2Q - Q \overset{\text{set}}{=} 0$, or $Q = \frac{2}{3}$

Price at $Q = \frac{2}{3}$ is $\frac{4}{3}$ and profits are $\frac{2}{3}$

Now draw supply, demand and marginal revenue (i.e., "relevant demand") curves. Draw a dotted line on this same graph showing the firm's profit curve. (Hint, find intercepts on the horizontal axis for ALL curves, then their intersections).

Solution: The supply curve is the MC curve, or $P = Q$. Demand is $P = 2 - Q$ and MR is $P = 2 - 2Q$ (steeper). The profit curve is centered on $Q = \frac{2}{3}$ with ends at 0 and $\frac{4}{3}$.

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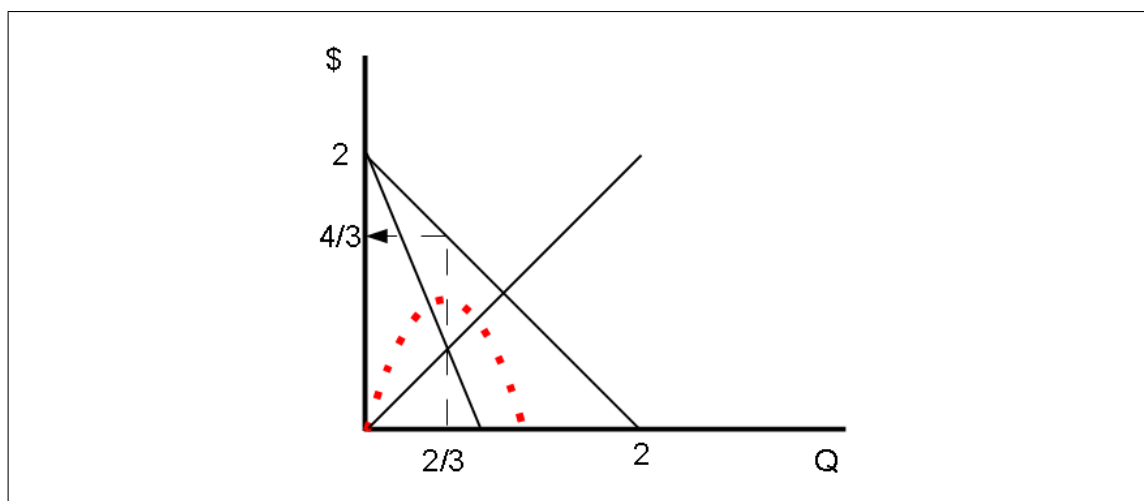
3. (2 points) In Chapter 10 ("Technology with a Human Face"), Schumacher compares mass production with production by the masses. Discuss these ideas in terms of labor (specialization) and demand for different cheeses. Now discuss the pros and cons of a government policy to increase "cheese production efficiency."

Solution: Mass production implies large scale facilities creating a few products. Production by the masses implies many, smaller facilities creating (by definition) a larger range of products. Labor specialization will be greater in the large scale facility because it's possible to keep one person busy all day on the same task. That's not true in smaller facilities, where workers will need to do more tasks. This means they will have a better overview of the production process, which tends to be more stimulating.

As noted on BB, I should have said "markets" for different cheeses, as this question is directed at the supply side. The answer would be that *the market* would have a more diverse supply of cheeses with production by the masses. It's not hard to see that these cheeses would meet a larger range of demands, but it's also clear that the prices of the most popular cheeses would be higher than they would be with mass production. These differences are visible when comparing the US (closer to mass production) to France (closer to production by the masses).

A government program to increase "cheese production efficiency" would focus on what's measurable, i.e., lower prices and greater quantities. Subsidies for research, inputs, equipment, training, etc. would increase scale and quantity while lowering prices. A government program would almost certainly harm production by the masses due to stronger competition from larger firms and difficulty in using "quantity-targeted" policies to improve quality, etc. It may also increase negative externalities in the quest for volume.

Note that job losses in ANY industry do not raise unemployment unless people cannot find jobs. Often they do, but at lower wages and or satisfaction. Also note that there's no reason for government to be involved in production of this private product, although there's probably a role in policing cheese safety or labeling (even that's debatable).