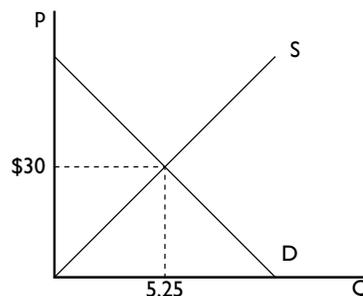


## First Midterm Exam

Each part of a question (a, b, c, etc.) is worth 5 points. Make sure to allot your time accordingly. Total of 35 points, -1 for messiness, -2 for extreme messiness.

1. A tax is progressive if the average tax rate (total tax divided by income) rises as income rises. This is true even if the tax is not an income tax but instead a tax on something else. Given this, is a sales tax on gasoline likely to be regressive, flat, or progressive?
2. *UAW* Recently the United Auto Workers union has made some concessions to General Motors, and will likely make the same concession to Ford and Chrysler. These concessions are complex, but the important effect is that, on average, wages will be lower in the American auto industry.

Let's treat the market for GM, Ford, and Chrysler cars separate from other carmakers so we don't have to worry about imports. The market might look something like this:



Note that both the supply and demand curves in this graph are drawn at 45-degree angles. (Just for information, the prices are in

thousands and the quantities are in millions, but it's easier just to work with them as they are on the graph.)

- (a) Find the demand and supply equations  $Q(p)$  and  $S(p)$ .
- (b) What is the price elasticity of demand and price elasticity of supply at the equilibrium point? (Answer in the easiest way that you can.)
- (c) How much money is spent on cars? How much of this spending is producer surplus? How much is costs?
- (d) Suppose the UAW concessions shift the supply curve down by \$1 (a parallel shift). Redraw the graph showing the old and new curves, and label the increase in consumer surplus, the decrease in costs, and the increase in producer surplus. (These will overlap, so you will need to use letters or colors to make this clear.)
- (e) Redraw the same diagram, with the same downward shift of the supply curve. But this time the shift is caused by a government subsidy. Show the total cost of the subsidy and the deadweight loss.
- (f) Explain why the union concessions do not add deadweight loss but the subsidy does.

When you are finished, please keep the exam sheet and hand in your blue book. Thanks.