

**EC 501: Problem Set 6**  
**(Due in class on Thursday, October 17)**

1. Adam and Barbara both buy widgets. Their (inverse) demand curves are respectively

$$p = 50 - 2q_a \text{ and } p = 50 - q_b.$$

What is their combined demand curve for widgets?

2. There are 100 people in Slobovia whose individual demands for widgets are:

20 people each have a perfectly inelastic demand for 50 widgets;

30 people each have a perfectly inelastic demand for 40 widgets;

40 people each have a perfectly elastic demand for widgets at a price of \$2 per widget;

10 people each have a perfectly elastic demand for widgets at a price of \$3 per widget.

Find the market demand curve for widgets and illustrate it graphically. Explain carefully.

3. The market for calculators is perfectly competitive. The current price is \$30 and 2 million calculators are sold annually. The elasticity of demand has been estimated to be -1.7 and the elasticity of supply to be 0.8.

(a) What would be the effect on the price of calculators and the quantity sold if government imposed a sales tax of \$1.80 per unit?

(b) How much tax revenue is collected? How much of this is actually paid by buyers?

4. The market for gadgets is in equilibrium, with the price at \$5 per unit and total sales being 1,000 gadgets per year. The elasticities of demand and supply at this equilibrium are estimated to be -0.7 and 2.0 respectively. Find the new equilibrium price and quantity as a result of the imposition of a 15% excise tax.

5. The market for widgets is in equilibrium, with price being \$10 per unit and 5 million widgets trading every year. By drawing a clearly-labeled diagram, show which of the following taxes would distort the widget market more:

(a) \$1 per unit excise tax

(b) 10% percentage excise tax.

6. The current price of widgets is \$13.5 per unit and 75 widgets are sold per period. Econometricians have estimated that the demand curve for widgets is

$$Q_d = 1000/p$$

And the supply curve is

$$Q_s = 50p - 600.$$

These do not match the observed values of  $p$  and  $Q$  exactly, but are regarded as pretty good estimates.

- (a) Suppose the government has found a way to reduce the marginal cost of widgets at all levels of output by \$4. If it gave this information to the firms in the industry, what would happen to the equilibrium price and quantity?
- (b) Suppose that distributing this information would cost the government \$400 per period. Should they distribute it? Explain clearly, drawing a diagram to show how you calculate the benefits from this information.