Elasticity Problems from Mansfield "Managerial Economics"
7th Edition, Chapter 2: Demand Theory, pages 56-69.

This only includes the problems that are appropriate for EC 600, Spring 2012.

1. The Dolan Corporation, a maker of small engines, determines that in 2008 the demand curve for its product is

$$P = 2{,}000 - 50Q$$

where P is the price (in dollars) of an engine and Q is the number of engines sold per month.

   a. To sell 20 engines per month, what price would Dolan have to charge?
   b. If managers set a price of $500, how many engines will Dolan sell per month?
   c. What is the price elasticity od demand if price equals $500?
   d. At what price, if any, will the demand for Dolan's engines be of unitary elasticity?

2. The Johnson Robot Company's marketing managers estimate that the demand curve for the company's robots in 2008 is

$$P = 3{,}000 - 40Q$$

where P is the price (in dollars) of a robot and Q is the number sold per month.

   a. Derive the marginal revenue curve for the firm.
   b. At what prices is the demand for the firm's product price elastic?
   c. If the firm wants to maximize its dollar sales volume, what price should it charge?

3. After a careful statistical analysis, the Chidester Company concludes the demand function for its product is

$$Q = 500 - 3P + 2P_r + 0.1I$$

where Q is the quantity demanded of its product, P is the price of its product, P_r, is the price of its rival's product, and I is per capita disposable income (in dollars). At present, P = $10, P_r = $20, and I = $6,000.

   a. What is the price elasticity of demand for the firm's product?
   b. What is the income elasticity of demand for the firm's product?
   c. What is the cross-price elasticity of demand between its product and its rival's product?

4. The Haas Corporation's executive vice president circulates a memo to the firm's top management in which he argues for a reduction in the price of the firm's product. He says such a price cut will increase the firm's sales and profits.

   a. The firm's marketing manager responds with a memo pointing out that the price elasticity of demand for the firm's product is about -0.5. Why is this fact relevant?
   b. The firm's president concurs with the opinion of the executive vice president. Is she correct?

5. Managers of the Hanover Manufacturing Company believe the demand curve for its product is

$$P = 5 - Q$$

Elasticity

(1) $P = 2000 - 50Q$

(a) $Q = 20 \rightarrow P = 2000 - 50(20) =$

(b) $P = 500 \rightarrow 500 = 2000 - 50Q =$

(c) $P = 2000 - 50Q \rightarrow \boxed{Q = \frac{2000}{50} - \frac{1}{50}P}$

$$\eta = \frac{dQ}{dP}\frac{P}{Q} = \left(-\frac{1}{50}\right)\left(\frac{P}{Q}\right) =$$

(d) $|\eta| = 1$ when $MR = 0$

$MR = D$ curve with double slope

$MR = 2000 - 100Q$

$MR = 0 \rightarrow 2000 - 100Q = 0$

$100Q = 2000$

$\boxed{Q = 20}$

to get P see part (a)

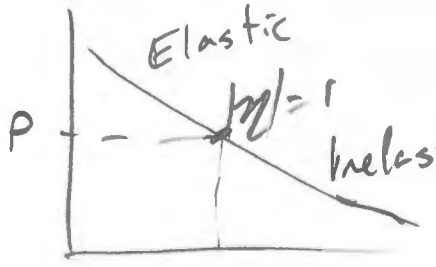
$P = 2000 - 50(20) =$

(2) $P = 3000 - 40Q$

(a) MR = D-curve with double the slope

$MR = 3000 - 80Q$

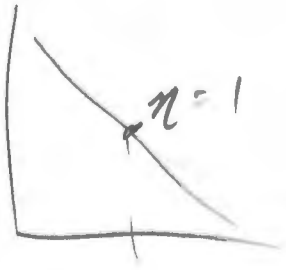
(b) We know $|\eta| = 1$ when $MR = 0$ and we know



(see p 46 in Bk)

So, set $MR = 0$, solve for Q, plug Q into P equation to get P at $|\eta| = 1$. Any p above this is a price for which demand is elastic.

(c) See p 46 in Bk. $MR = 0$ also maximizes Revenue



So, same P as we found in part (b).