

ECON 110, Prof. Hogendorn

Problem Set 2

1. *SUVs*. This question asks you to analyze the market for Sport Utility Vehicles (SUVs) using a *nonlinear* demand curve.

- (a) The demand function (measured in hundreds of thousands of vehicles) for SUVs turns out to be $q^d = 4027p^{-1.5}$, where p is the price of a typical SUV (in this problem we will measure price in tens of thousands of dollars). What are the first and second derivatives of this function? Graph the function and explain how the first and second derivatives relate to the shape of the graph.
- (b) The supply of SUVs turns out to be $q^s = 258.3p$. What is the equilibrium price and quantity?
- (c) Suppose that the price of gas rises. Which of the following is more likely to be the new demand curve for SUVs? Why?

$$q^d = 4300p^{-1.5} \quad q^d = 3700p^{-1.5}$$

- (d) Calculate and graph what happens to the equilibrium price and quantity after the demand curve changes.
2. *Shifters*. Illustrate and explain the impact on equilibrium market price and quantity exchanged of each of the following changes:
 - (a) An improvement in the technology of production
 - (b) An increase in individuals' desire for the good
 - (c) A decrease in the wage paid to all workers (be careful here)

Review Problems only, not to turn in:

3. *psquared*. Suppose the demand function for a good is $q = 100 - 2p^2$.
- (a) Find the first and second derivatives of this demand function. What are the signs of the derivatives?
 - (b) Graph this demand function. Explain how your answer to part (a) affects the shape of the curve.

Answers to Review Problems:

3. *psquared_a*.

- (a) The derivatives are:

$$\frac{dq}{dp} = -4p < 0 \quad \frac{d^2q}{dp^2} = -4 < 0$$

- (b) From (a) we know that the function is downward sloping and concave:

