Homework #4

problem #14, from Ch. 4, p. 99 of Case/Fair *Principles*…(6th ed.)
a few problems of my own
modifications of problems #5 and 6 from Ch. 6, p. 144 of Parkin *Microeconomics* (7^{th} ed.)
modifications of problems #5 and 14 from Ch. 5, p. 132–33 of Krugman/Wells *Microeconomics* (1^{st} ed.)

14. Studies have fixed the short-run price elasticity of demand for gasoline at the pump at –0.20. Suppose that international hostilities lead to a sudden cutoff of crude oil supplies. As a result, U.S. supplies of refined gasoline drop 10 percent.

a. If gasoline was selling for $1.40 per gallon before the cutoff, how much of a price increase would you expect to see in the coming months?

b. Suppose that the government imposes a price cieling on gas at $1.40 per gallon. How would the relationship between consumers and gas station owners change?

Do this too! Bob is a shoemaker and an economist. He has estimated the following demand curve for his shoes:

$$\mathbf{Q_D = 700 - 10P}$$

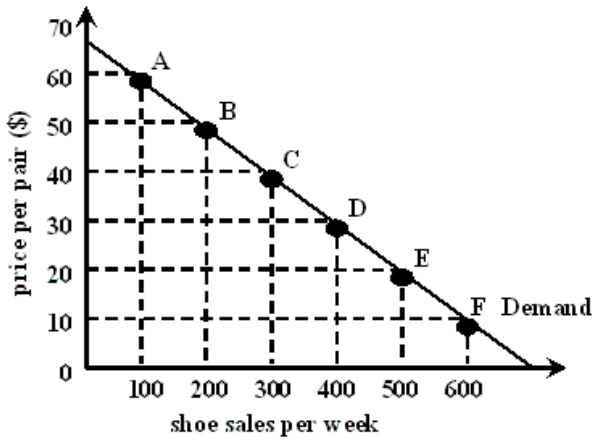
a. Calculate the price elasticity of demand at points A through F.

b. Find the price at which demand is unit elastic.

c. What happens to Bob's total revenue (P*Q):

- if Bob increases the price from $20 to $30?
- if Bob increases the price from $30 to $40?
- if Bob increases the price from $40 to $50?

d. How could you use the answers to **a.** and **b.** to predict the answers to **c.**?



Do this too! Find the price and quantity where the price elasticity of demand equals one (unitary elasticity) for the following linear demand functions:

- $\mathbf{Q_D = 8 - 2P}$
- $\mathbf{Q_D = 9 - 3P}$
- $\mathbf{Q_D = 10 - 4P}$

What would be the effect on revenue if the price rose from the level of unitary elasticity? If the price level fell? Why does revenue increase/decrease?

Do this too! The market demand function for a certain good is given by: $\mathbf{Q_D = 100 - 5P}$.
Use that market demand function to answer following questions:

1. What is the price elasticity of demand when the price is $ 5?

2. What is the price elasticity of demand when the price is $10?

3. What is the price elasticity of demand when the price is $15?

4. Over what **range** of prices is demand for the good inelastic?

5. Over what **range** of prices is demand for the good elastic?

6. How does the concept of elasticity describe the way in which quantity demanded responds to changes in price?

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5. The table gives the demand and supply schedules for chocolate brownies:

a. If brownies are not taxed, what is the price of a brownie and how many are consumed?

b. If brownies are taxed at $0.20 each, what is the price and how many brownies are consumed? What is government revenue?

c. How much of the tax is paid by consumers? How much of the tax is paid by producers?

price per brownie	quantity demanded (in millions)	quantity supplied (in millions)
$0.50	5	3
$0.60	4	4
$0.70	3	5
$0.80	2	6
$0.90	1	7

6. The demand and supply schedules for roses are:

a. If there is no tax on roses, what is the price and how bunches are bought?

b. If a tax of $6 a bunch is introduced, what is the price and how many bunches are bought? What is government revenue?

c. How much of the tax is paid by consumers? How much of the tax is paid by producers?

price per bunch	quantity demanded (bunches per week)	quantity supplied (bunches per week)
$10	5	3
$12	4	4
$14	3	5
$16	2	6
$18	1	7

5. The accompanying table lists the cross-price elasticities of demand for several goods:

percentage change in the quantity demanded of:	percentage change in the price of:	cross-price elasticity of demand:
air-conditioning units	kilowatts of electricity	–0.34
Pepsi	Coke	+0.63
high-fuel-consuming sport utility vehicles	gasoline	–0.28
Burger King burgers	McDonald's burgers	+0.82
margarine	butter	+1.54

a. Explain the significance of each of the cross-price elasticities. What does it imply about the relationship between the two goods in question?

b. Compare the absolute values of the cross-price elasticities and explain their magnitudes. For example, why is the cross-price elasticity of McDonald's and Burger King burgers less than the cross-price elasticity of butter and margarine?

c. Use the information in the table to calculate how a 5 percent increase in the price of Coke affects the quantity of Pepsi demanded.

d. Use the information in the table to calculate how a 10 percent decrease in the price of gasoline affects the quantity of SUVs demanded.

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14. Suppose that the government imposes an excise tax of $1 for every gallon of gas sold. Before the tax, the price of a gallon of gas is $2. Consider the following four after-tax scenarios. In each case:

(i) use an elasticity concept to explain what must be true for this scenario to arise
(ii) determine who bears relatively more of the burden of the tax, producers or consumers and
(iii) illustrate your answer with a diagram.

a. The price of gasoline paid by consumers rises to $3 per gallon. Assume that the demand curve is downward sloping.
b. The price paid by consumers remains at $2 per gallon. Assume that the supply curve is upward sloping.
c. The price of gasoline paid by consumers rises to $2**.**75 per gallon.
d. The price of gasoline paid by consumers rises to $2**.**25 per gallon.