10/08/2015

Econ 142 Discussion Week 7 Assignment Answer Key

1) $Q_D = 240 - 4P$

$Q_S = 2P$

Equilibrium Price & Quantity:

At Eq. $Q_D = Q_S$. You can find eq. P by setting the equations for Q_D & Q_S equal to one another, and then solving for P:

$$240 - 4P = 2P$$
$$240 = 6P$$
$$240/6 = P$$
$$\boxed{P = 40}$$

The plug the eq P into either the Q_S or Q_D equation to get the eq Q:

$Q_S = 2P$
$= 2(40)$
$= 80$

$Q_D = 240 - 4(40)$
$= 240 - 160$
$= 80$

So $\boxed{Q = 80}$

1) continued

Price Elasticity of Demand:

$$\varepsilon = \frac{dQ_D}{dP} \cdot \frac{P}{Q}$$

$$\frac{dQ_D}{dP} = -4 \quad \text{and} \quad \frac{P}{Q} = \frac{40}{80} = .5$$

So $\varepsilon = -4 \cdot (.5) = \boxed{-2}$ (elastic)

Price Elasticity of Supply:

$$\varepsilon = \frac{dQ_S}{dP} \cdot \frac{P}{Q}$$

$$\frac{dQ_S}{dP} = 2 \quad \text{and} \quad \frac{P}{Q} = .5$$

So $\varepsilon = 2 \cdot (.5) = \boxed{1}$

Impact of Price Increase on Total Revenue:

Increase in price will <u>decrease</u> total revenue because demand is elastic.

2) $Q_D = 100 - \frac{1}{2}P$

$Q_S = 2P$

Equilibrium Price & Quantity:

$Q_D = Q_S$

$100 - \frac{1}{2}P = 2P$

$100 = 2.5P$

$100/2.5 = P$

$\boxed{P = 40}$

$Q_D = 100 - \frac{1}{2}(40)$

$= 100 - 20$

$= 80$

$Q_S = 2(40)$

$= 80$

$\boxed{Q = 80}$

Price Elasticity of Demand:

$\varepsilon = \frac{dQ_D}{dP} \cdot \frac{P}{Q} = -\frac{1}{2} \cdot 40/80 = \boxed{-.25}$

inelastic

Price Elasticity of Supply:

$\varepsilon = \frac{dQ_S}{dP} \cdot \frac{P}{Q} = 2 \cdot 40/80 = \boxed{1}$

Unit elastic

Price Changes & Revenue:

Increasing price would increase revenue because demand is inelastic. Decreasing price would decrease revenue.

3. Calculate price elasticity of demand based using the following table of values:

	Price	Quantity
Point A	$3.50	2,000
Point B	$3.30	2,100

$$\varepsilon = \frac{\Delta Q / \bar{Q}}{\Delta P / \bar{P}}$$

$\Delta Q = 2000 - 2100 = -100$

$\bar{Q} = \frac{2000 + 2100}{2} = 2050$

$\Delta P = 3.50 - 3.30 = .20$

$\bar{P} = \frac{3.50 + 3.30}{2} = \frac{6.8}{2} = 3.4$

$\varepsilon = \frac{-100/2050}{.20/3.4}$

$= \frac{-.0488}{.0588} = \boxed{-.83}$

Is demand elastic or inelastic between point A and point B?

It is inelastic because ε is less than 1 in absolute value.

If the quantity at point B were 2,500, what would the price elasticity of demand be? Is demand elastic or inelastic in this case?

$\Delta Q = 2000 - 2500 = -500$

$\bar{Q} = \frac{2000 + 2500}{2} = \frac{4500}{2} = 2250$

$\Delta P = .20$ } same as above

$\bar{P} = 3.4$ }

$\varepsilon = \frac{\Delta Q / \bar{Q}}{\Delta P / \bar{P}} = \frac{-500/2250}{.0588}$

$= \frac{-.22\bar{2}}{.0588}$

$= \boxed{-3.78}$

In this case the demand is elastic.