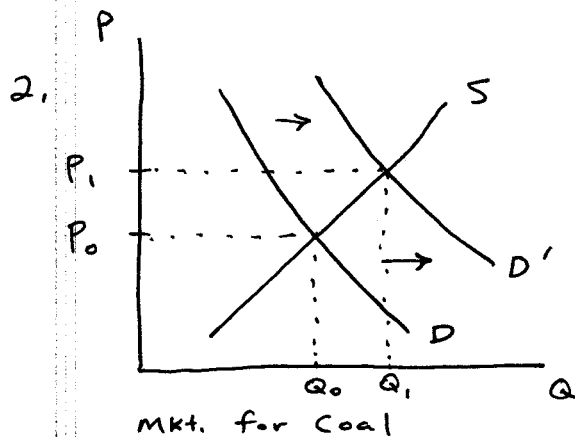


$$1. (a) \quad \epsilon_{X, P_X} = \frac{\Delta Q}{Q_0 + Q_1} / \frac{\Delta P}{P_0 + P_1} = \frac{2}{12} / \frac{2}{18} = 1.5$$

$$(b) \quad \epsilon_{X, I} = \frac{\Delta Q}{Q_0 + Q_1} / \frac{\Delta I}{I_0 + I_1} = \frac{2}{12} / \frac{10000}{50000} = \frac{5}{6}$$

$$(c) \quad \epsilon_{X, P_Y} = \frac{\Delta Q}{Q_0 + Q_1} / \frac{\Delta P_Y}{P_Y^0 + P_Y^1} = \frac{2}{12} / (-) \frac{2}{18} = -1.5$$



An increase in the price of a substitute good (natural gas) will lead to an increase in the demand for coal. The price of coal will rise and more coal will be bought and sold.

3. (a) $30\% \times 290,000 = 87,000$ older teenagers who currently smoke.

$$\epsilon_{X, P_X} = \frac{\% \Delta Q}{\% \Delta P} ; \quad \% \Delta P \approx 50\% \quad (\$2 \rightarrow \$3)$$

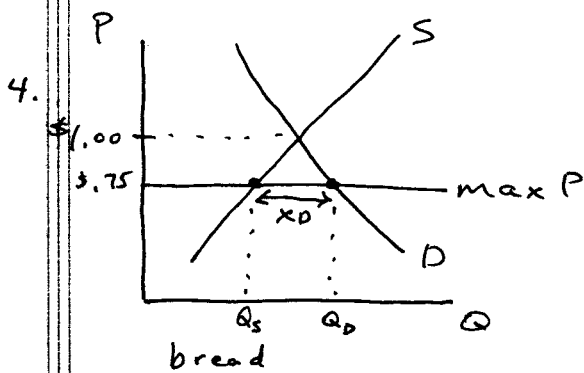
$$\% \Delta Q = (.6)(50\%) = 30\% \text{ reduction in } Q$$

if P increases by 50%.

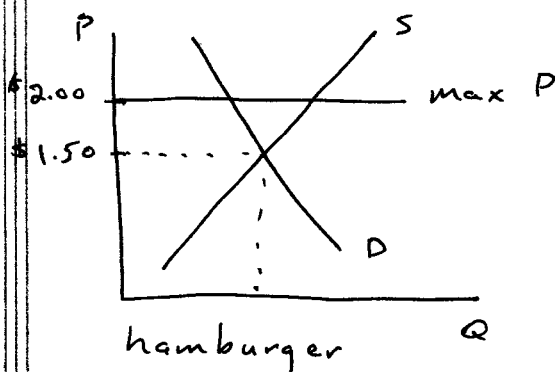
$30\% \times 87,000 = 26,100$ fewer smokers after the tax among 15-19 year olds.

- (b) A cigarette tax imposed on cigarette vendors in Fayette Co. would not affect vendors in Jessamine, Clark, Scott, and Woodford Counties.

(cont.) 3(b) So the estimate of demand elasticity used in (a) does not take into account how easy it would be for people to avoid the Fayette Co. tax. So the reduction in smoking among teenagers is likely to be much less than 30%.



A price ceiling set below the market-clearing price will create a shortage or excess demand.



A price ceiling set above the market-clearing price will have no effect.

