**Quiz #1 Answer Key**

1. (7.5 points) The coconut oil demand function (Buschena and Perloff, 1991) is

$$Q=1200-9.5p+16.2p\_{p}+0.2Y$$

where *Q* is the quantity of coconut oil demanded in thousands of metric tons per year, *p* is the price of coconut oil in cents per pound, $p\_{p}$ is the price of palm oil in cents per pound and *Y* is the income of consumers.

Assume that *p* is initially 45¢ per pound, $p\_{p}$ is 31¢ per pound, and *Q* is 1,275 thousand metric tons per year. Calculate the income elasticity of demand for coconut oil at the initial point.

*1275 = 1200 − (9.5)(45) + (16.2)(31) + 0.2Y → 75 = −427.5 + 502.2 + 0.2Y → Y = 1.5 and ξ = (Y/Q)(ΔQ/ΔY) = (1.5/1275)(0.2) = 0.00024.*

*For other points*

*ξ = (Y/Q)(ΔQ/ΔY) = 0.2(Y/Q).*

2. (7.5 points) The United States Tobacco Settlement between the major tobacco companies and 46 states caused the price of cigarettes to jump 21% (45¢ per pack). Levy and Meara (2006) found only a 2.65% drop in prenatal smoking 15 months later.

What is the elasticity of demand for this group? Is their cigarette demand elastic or inelastic?

*Elasticity of demand for prenatal smoking is inelastic:*

*ε = %ΔQ/%ΔP*

*= −2.65/21*

*= −0.1262.*

**BONUS** (2 points): Use calculus to prove that the elasticity of demand is a constant ε everywhere along the demand curve whose demand function is $Q=Ap^{ε}$.

*Differentiating the demand function as Q = Apε with respect to p, we find that dQ/dp =ε Apε-1. Toget the elasticity, we multiply dQ/dp by p/Q = p/Apε-1 =1/Apε-1. That is, the elasticity is*

*ε Apε-1 \* 1/Apε-1 =ε . Because this result holds for any p, the elasticity is the same, ε, at every point along the demand curve.*