

HW#7 Due Feb 15, 2022

Mankiw Page 107

3. Suppose the price elasticity of demand for heating oil is 0.2 in the short run and 0.7 in the long run.
- a. If the price of heating oil rises from \$1.80 to \$2.20 per gallon, what happens to the quantity of heating oil demanded in the short run? In the long run? (Use the midpoint method in your calculations.)
 - b. Why might this elasticity depend on the time horizon?

7. Suppose that your demand schedule for pizza is as follows:

Price	Quantity Demanded (income = \$20,000)	Quantity Demanded (income = \$24,000)
\$8	40 pizzas	50 pizzas
10	32	45
12	24	30
14	16	20
16	8	12

- a. Use the midpoint method to calculate your price elasticity of demand as the price of pizza increases from \$8 to \$10 if (i) your income is \$20,000 and (ii) your income is \$24,000.
- b. Calculate your income elasticity of demand as your income increases from \$20,000 to \$24,000 if (i) the price is \$12 and (ii) the price is \$16.

3. (a) Short run

$$0.2 = \frac{x}{\frac{2.2-1.8}{2}}$$

$$x = (0.4)(2.2-1.8) \\ = 0.16$$

Long run

$$0.7 = \frac{x}{\frac{2.2-1.8}{2}}$$

$$x = (1.4)(2.2-1.8) \\ = 0.56$$

7. (a) income: \$ 20,000

$$\frac{\Delta Q}{\Delta P} = \frac{\frac{32-40}{36}}{\frac{10-8}{9}} = 1$$

income: \$ 24,000

$$\frac{\Delta Q}{\Delta P} = \frac{\frac{45-50}{47.5}}{\frac{10-8}{9}} = 0.4737$$

(b) Price: \$ 12

$$\frac{\Delta Q}{\Delta I} = \frac{\frac{30-24}{27}}{\frac{24,000-20,000}{22,000}} = \frac{11}{9} \text{ or } 1.2$$

$$\frac{\Delta Q}{\Delta I} = \frac{\text{Price: } \$ 16}{\frac{42-8}{10}} = \frac{11}{5} \text{ or } 2.2$$