1.7 Building a Demand Function - Practice Problems (Answers)

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ECON 306 - Spring 2020

You can spend your income on apples and oranges. Apples currently cost $0.25 and oranges cost $0.50. When your income is $40, you buy 10 apples and 8 oranges. When your income increases to $80, you buy 12 apples and 6 oranges

1. What type of good are apples (inferior, necessity, luxury)?

> **Solution:**
>
> $$\frac{\left(\frac{a_2-a_1}{a_1}\right)}{\left(\frac{m_2-m_1}{m_1}\right)} = \frac{\left(\frac{12-10}{10}\right)}{\left(\frac{80-40}{40}\right)} = \frac{\left(\frac{2}{10}\right)}{\left(\frac{40}{40}\right)} = \frac{0.20}{1} = 0.20$$
>
> Apples are (normal) necessity goods. For every 1% increase in income, you buy 0.20% more apples.

2. What type of good are oranges (inferior, necessity, or luxury)?

> **Solution:**
>
> $$\frac{\left(\frac{o_2-o_1}{o_1}\right)}{\left(\frac{m_2-m_1}{m_1}\right)} = \frac{\left(\frac{6-8}{8}\right)}{\left(\frac{80-40}{40}\right)} = \frac{\left(\frac{-2}{8}\right)}{\left(\frac{40}{40}\right)} = \frac{-0.25}{1} = -0.25$$
>
> Apples are inferior goods. For every 1% increase in income, you buy 0.25% *fewer* oranges.

You can can have cereal and milk for breakfast. When milk is \$2/gallon, you consume 5 bowls of cereal per week. When milk increases to \$4/gallon, you consume 4 bowls of cereal per week.

3. What is the relationship between these two goods?

> **Solution:** These goods are complements.

4. What is the cross-price elasticity?

> **Solution:**
>
> $$\frac{\left(\frac{c_2 - c_1}{c_1}\right)}{\left(\frac{pm_2 - pm_1}{pm_1}\right)} = \frac{\left(\frac{4-5}{5}\right)}{\left(\frac{4-2}{2}\right)} = \frac{\left(\frac{-1}{5}\right)}{\left(\frac{2}{2}\right)} = \frac{-0.20}{1} = -0.20$$
>
> For every 1% increase in the price of milk, you buy 0.20% *fewer* boxes of cereal.