Monmouth COLLEGE

- Name: _____
- Date: _____
- Section: _____

# ECON 300: Intermediate Price Theory

## Problem Set #4 - Part #2

## Fall 2024

**Problem 1. Deriving the Engel Curve**

Suppose that the consumer is participating in a market consisting of goods $x$ and $y$. The price of good $x$ is 2, the price of good $y$ is 1. The consumer's utility function is given as follows:

$$u(x, y) = x + 2y$$

1.A. If the consumer's income is $M_0 = 2$, what is the consumer's optimal consumption bundle?

1.B. If the consumer's income is $M_1 = 6$, what is the consumer's optimal consumption bundle?

1.C. If the consumer's income is $M_2 = 10$, what is the consumer's optimal consumption bundle?

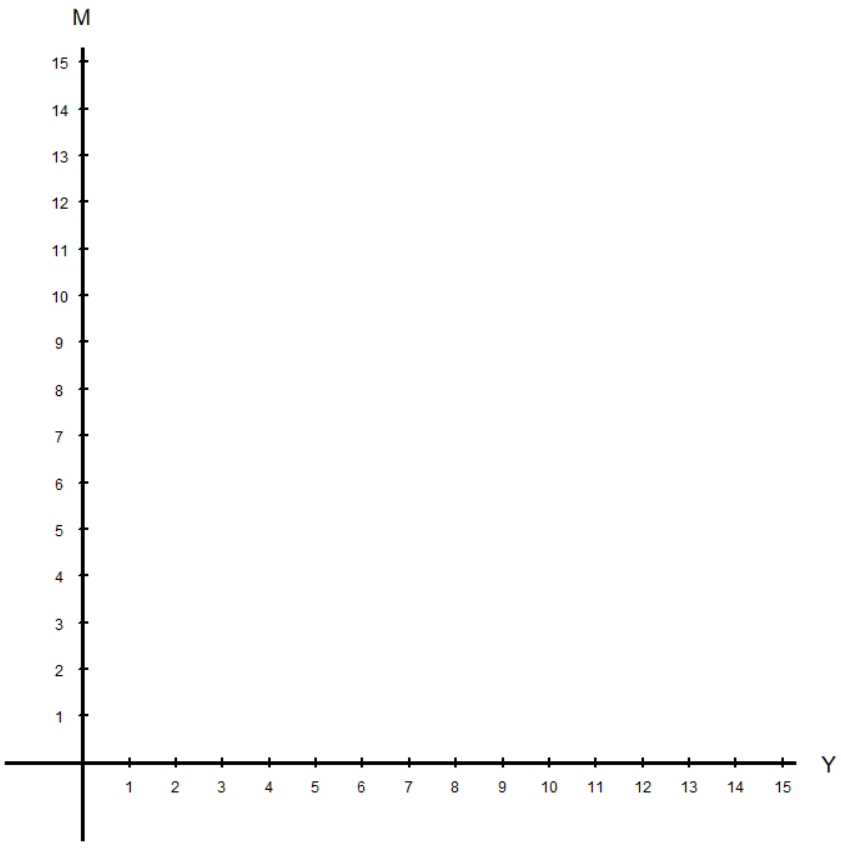
1.D. If the consumer's income is $M_3 = 14$, what is the consumer's optimal consumption bundle?

**Problem 1. Deriving the Engel Curve (continued)**

Suppose that the consumer is participating in a market consisting of goods $x$ and $y$. The price of good $x$ is 2, the price of good $y$ is 1. The consumer's utility function is given as follows:

$$u(x, y) = x + 2y$$

1.E. Using your answers from `1.A` through `1.D`, plot the consumer's Engel curve for good $y$ in the diagram below.




1.F. Is good $y$ a Normal good or an Inferior good? Why?

**Problem 2. Individual and Market Demand**

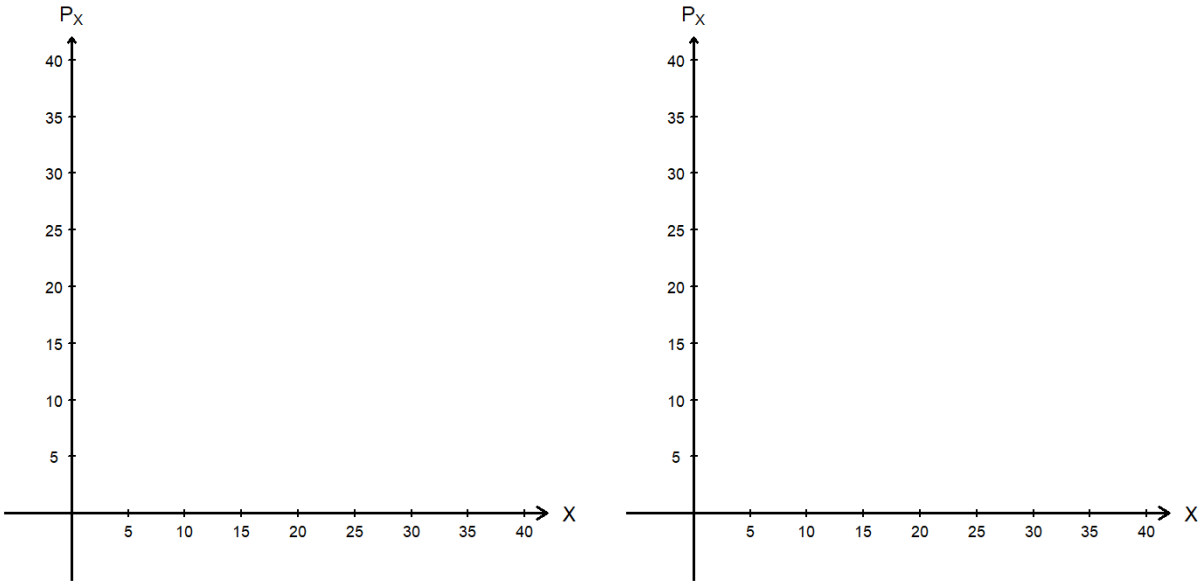
Suppose we have a market for good $x$ with two consumers. Their individual demand functions are:

- Consumer 1: $x_1 = 10 - \frac{1}{4}P_x$
- Consumer 2: $x_2 = 20 - \frac{2}{3}P_x$

2.A Find the inverse demand function for consumer 1.

2.B Find the inverse demand function for consumer 2.

2.C Plot the consumer 1's demand curve to the left, and consumer 2's demand curve to the right.

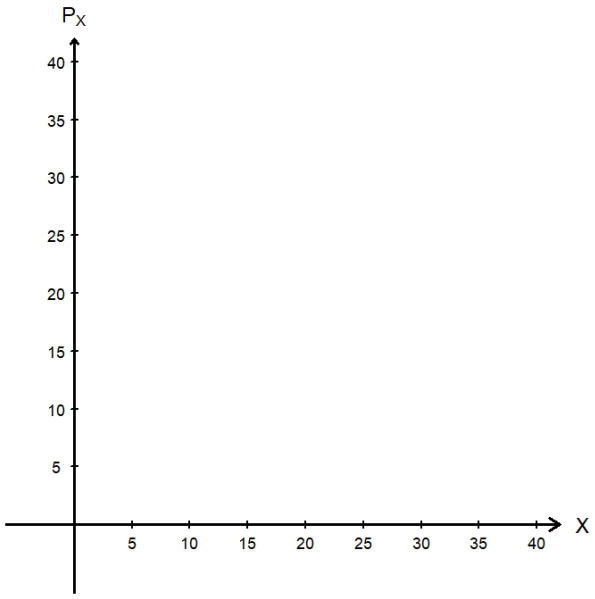


**Problem 2. Individual and Market Demand (continued)**

Suppose we have a market for good $x$ with two consumers. Their individual demand functions are:

- Consumer 1: $x_1 = 10 - \frac{1}{4}P_x$
- Consumer 2: $x_2 = 20 - \frac{2}{3}P_x$

2.D. Plot the market demand for good $x$.




2.E. (ADVANCED) Find the formula for the market demand.

- Score: _____
- Extra Credit: _____