Chapter 4 – “Consumer Choice.”

“Review Questions” (pages 128-129): 1, 2, 3, 4, 5, 6, and 7.
“Problems” (pages 129-132): 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, and 4.8.

Additional Questions:

1) Consider an individual with $I = 500$ facing prices of $(p_1, p_2) = (2.5)$.
Graphically illustrate the budget line of this consumer. Graphically illustrate each
of the following consumption bundles in relation to this budget line, and explain
why each bundle is either affordable or not affordable.
   i. $(x_1, x_2) = (50,50)$.
   ii. $(x_1, x_2) = (100,60)$.
   iii. $(x_1, x_2) = (80,80)$.
   iv. $(x_1, x_2) = (200,10)$.
   v. $(x_1, x_2) = (150,40)$.

2) Consider a consumer with monotonic preferences. Which of the bundles in parts
   (i) through (v) of Question 1 could potentially maximize utility? Explain.

3) For a consumer with preferences that can be represented by $u(X) = x_1 x_2$, the
   marginal utility for each commodity is $MU_1 = x_2$ and $MU_2 = x_1$. Determine
   optimal levels of consumption as functions of $p_1$, $p_2$, and $I$. Determine the
   optimal levels of consumption as functions of $p_1$, $p_2$, and $I$ if instead
   $u(X) = 8 \sqrt{x_1 x_2}$ (in which case $MU_1 = 4 \frac{x_2}{x_1}$ and $MU_2 = 4 \frac{x_1}{x_2}$).

4) Mo has monotonic preferences for $x_1$ and $x_2$. For each of the following
   scenarios, clearly explain how his budget line will change and determine if he will
   be “better off” or “worse off” as a result of the change (if it is not possible to
determine if he will be “better off” or “worse off,” clearly explain why):
   i. A decrease in $p_1$, with $p_2$ and $I$ unchanged.
   ii. A decrease in $I$, with $p_1$ and $p_2$ unchanged.
   iii. A simultaneous increase in $p_1$ and $I$, with $p_2$ unchanged.
   iv. A 10% increase in both $p_1$ and $p_2$, with $I$ unchanged.
   v. An 8% increase in $p_1$, $p_2$, and $I$.
5) Consider a consumer with preferences that can be represented by the utility function \( u(X) = \min \{ x_1, \frac{1}{7} x_2 \} \). Determine optimal levels of consumption as functions of \( p_1, p_2, \) and \( I \). Determine the functional form of \( V(p_1, p_2, I) \).

6) The graph below illustrates Joe’s budget constraint, along with three of his indifference curves. Based upon this graph, answer the following.

![Graph with indifference curves and budget constraint]

i. Suppose Joe wants to maximize his utility, subject to the constraint of \( p_1 x_1 + p_2 x_2 \leq I \). Considering each of the five bundles illustrated above, clearly explain why the bundle is or is not a “solution” to this problem.

ii. Suppose \( I = 500 \). Determine the values of \( p_1 \) and \( p_2 \).

iii. Suppose Joe wants to realize \( U(X) = 40 \) while spending as little money as possible. Considering each of the five bundles illustrated above, clearly explain why the bundle is or is not a “solution” to this problem.

7) Explain why each of the following could not be a valid indirect utility function:

i. \( V(p_1, p_2, I) = 10 p_1 p_2 I \)

ii. \( V(p_1, p_2, I) = p_1 + p_2 + I \)

iii. \( V(p_1, p_2, I) = \frac{4I}{p_1 p_2} \)

iv. \( V(p_1, p_2, I) = \frac{I + 100}{\sqrt{p_1 p_2}} \)