

EconS 301- Intermediate Microeconomic Theory
Homework #2 - Due date: Tuesday September 20th, 2022.

1. Sarah has utility function $u(x, y) = x^{1/2}y^{1/4}$, facing prices $p_x = \$3$ and $p_y = \$2$, and income $I = \$16$. Using the same steps as in example 3.2 (Chapter 3, page 52), find Sarah's optimal consumption of goods x and y .
2. Kevin's utility function is $u(x, y) = 3x + 4y$ and faces prices $p_x = \$1$ and $p_y = \$2.5$ and income $I = \$23$. Comparing his $MRS_{x,y}$ and the price ratio, find his optimal consumption of goods x and y .
3. John's utility function is $u(x, y) = 5 \min\{2x, 3y\}$ and he faces prices $p_x = \$1$ and $p_y = \$2$ and income $I = \$100$. Find his optimal consumption of goods x and y .
4. Luke has a weekly income of $I = \$40$ that he allocates between purchasing goods x and y . When the price of good x is $\$4$ and the price of good y is $\$4$, Luke purchases 3 units of good x and 7 units of good y in equilibrium. Suppose now that the price of good x falls to $\$2$.
 - (a) Find the equation of his original and new budget lines, and represent it graphically.
 - (b) Suppose that Luke's new equilibrium bundle is 5 units of good x and 5 units of good y . Does this new bundle violate WARP? Explain why or why not.
 - (c) Suppose now that Luke's new equilibrium bundle contained 4 units of good y . How many units of good x must be consumed such that our equilibrium allocation does not violate WARP?
5. Eric wishes to reach a utility level of $U = 50$ and has a quasilinear utility function of the type $u(x, y) = 4x + y^{1/2}$. The price of good x is $\$2$ while the price of good y is $\$2$.
 - (a) Find Eric's tangency condition following step 1 of the expenditure minimization procedure.
 - (b) Find Eric's equilibrium quantities for goods x and y .
 - (c) How much income does Eric require to reach his target utility level?
6. Brandon's utility function is $u(x, y) = x^{1/3}y^{2/3}$, his income is $I = \$150$, and the price of good y is $p_y = \$1$. The price of good x decreases from $p_x = \$3$ to $p'_x = \$1$. Using the steps in example 4.8 (Chapter 4, pages 91-92), find the substitution and income effects.