In-class problem: Applying Consumer Choice

1. Jane consumes figs and berries. Her current consumption bundle of figs and berries exhausts her income. The last package of figs she eats costs her $2 and gives her 8 utils (her measurement of utility). The last carton of berries she eats costs her $1 and gives her 5 utils. Show how Jane can afford to be happier. (Hint: use the ratio \( \frac{MU_x}{P_x} \), which tells us the additional utility that $1 can buy if Jane allocate this $1 to buying good x, and compare it with the case where she allocate this $1 instead to buying the other good.)

2. Consider the utility of the right shoe and the left shoe (let the left shoe on the y-axis and the right shoe on the x-axis), show graphically the income and substitution effects (if any) when the price of the right shoe increase holding the price of the left shoe constant.

3. Ian consumes only two goods, potato (denoted by X) and beef (denoted by Y) in his life. To him potato is an inferior good.
   a. Can beef also be an inferior good to him? Why?
   b. If Ian’s income goes up, while everything else stays the same, draw a graph showing his old and new budget constraints, and mark his old and new optimal consumption points. How does your graph show that potato is an inferior good to him?
   c. If the price of potato goes up, while everything else stays the same, draw a graph showing Ian’s old and new budget constraints, and mark his old and new optimal consumption points. Show on the same graph the substitute effect and income effect of this price change. Do they work in the same direction? How is the fact that potato is an inferior good embodied in your graph?

4. Ms. A has utility function defined by \( U(m,b) = m^{cb} \) where m and n are her demands for two commodities, mangoes and bananas. Denote I as income, p the price of mangoes and q the price of banana. Assume I, p, q are positive.
   a. show that the demand for mangoes is given by:

   \[
   m = \frac{c}{c+d} \frac{I}{p}
   \]

   b. Now if the demand becomes, \( U(m,b) = c \ln(m) + d \ln(b) \) show that the demand for mangoes can also be written as above. Why?