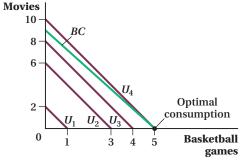⌐ 13. Carmen's preferences are such that she is always indifferent between watching two movies or seeing one basketball game.

a. What must Carmen's indifference curves look like?

b. Suppose that Carmen has an income of $90. If a movie costs $10 and a basketball game costs $18, what will Carmen's optimal consumption bundle be?

c. Suppose instead that Carmen's utility function is $U = 5XY$, where X denotes the basketball games and Y denotes the movies. What are Carmen's optimal consumption bundle and utility at the original prices? Note: Fractional answers are OK.

d. Maintaining the utility function from (c), if the price of basketball games increases to 20, what does Carmen consume at the optimum at the new prices?

e. Maintaining the utility function from (c), find the substitution effect, the income effect, and the total effect of the price change.

f. Maintaining the utility function from (c), is good X a normal or an inferior good for Carmen?

g. Maintaining the utility function from (c), derive Carmen's Marshallian demand curve for X, and show that the Law of Demand is satisfied using calculus.

h. Maintaining the utility function from (c), derive Carmen's Hicksian demand curve for X using calculus.