

c) Calculate Justin's MRS when he consumes 10 hours of TV and 14 hours of hockey. (4 points)

3. Jeremy's preferences for good X and good Y can be summarized with the following utility function: $U(x,y)=(2X+2)(Y+1)$. Jeremy has \$161 to spend on X and Y. X costs \$1 per unit and Y costs \$2 per unit.

a) Write down an expression describing Jeremy's marginal rate of substitution between X and Y. (5 points)

b) When Jeremy has 9 units of X and 19 units of Y, how many units of X is he willing to trade in for another unit of Y? (5 points)

c) Given Jeremy's constraints, how much X and Y will he choose to consume? (10 points)

4. Bob's demand curve for milkshakes is $X = -3P_x^3 + P_y + 2$, where X is the number of milkshakes he consumes and Y is another good.

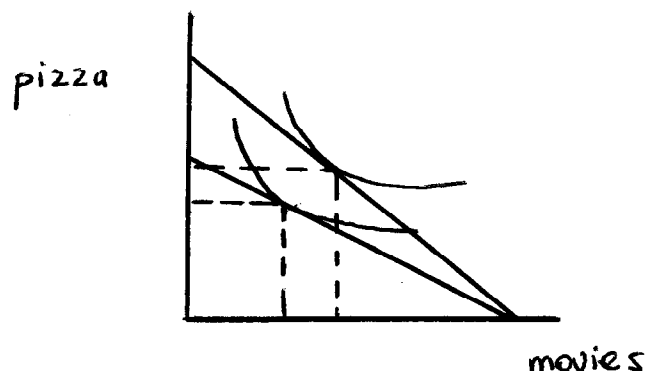
a) Is Y a substitute for milkshakes or a complement? Why? (3 points)

b) Use calculus to write an equation that describes the price elasticity of demand for good X. (5 points)

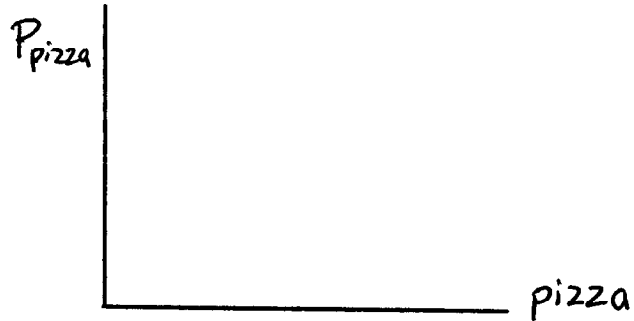
c) When milkshakes cost \$1 a piece and Bob consumes 4 of them, what is his price elasticity of demand for milkshakes? Is his demand for x elastic, inelastic or unit elastic? (5 points)

d) Based on your answer to c) what will happen to the revenues of a milkshake stand if it raises the price of milkshakes from \$1 to \$2? Why? (5 points)

5. a) Are the two goods on the diagram below complements or substitutes? Why? (5 points)



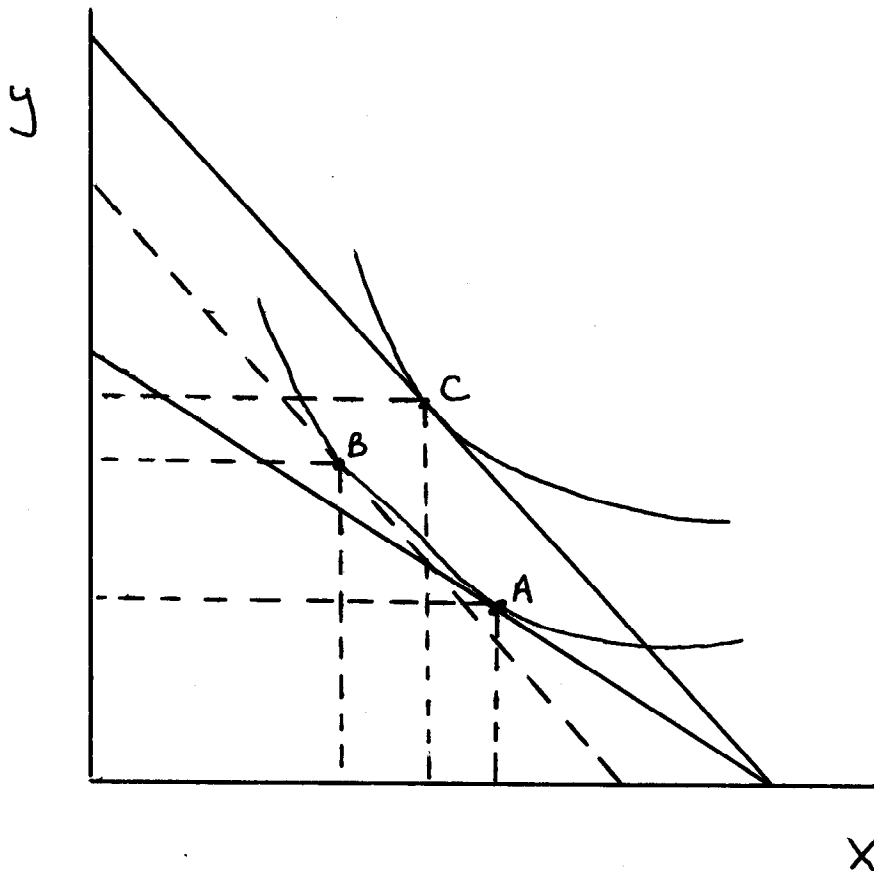
- b) Based on your answer to a), what will happen to the demand curve for pizzas when the price of movies falls? Show below. (3 points)



- c) On the diagram in part a) draw the price consumption curve and label it. (3 points)

6. Use the diagram below to answer the following questions.

- a) Are X and Y complements or substitutes? (3 points)
 b) Is Y a normal good or an inferior good? (3 points)
 c) Is Y a Giffen good? (5 points)



7. Use the diagram below to answer the following questions. Note that $p_x=1$.

a) How much income does this consumer have? (4 points)

b) Circle **all** of the following words that describe the relationship between the two goods: (4 points—you lose 2 points for each wrong choice here)

Complements, substitutes, perfect complements, unit elastic, perfect substitutes, no relationship.

c) If the consumer chooses bundle A, what is the price of Y? (4 points)

d) If the consumer chooses bundle A, how much Y does he consume? (4 points)

e) If the consumer chooses bundle B, how much X and how much Y does he choose? (10 points)

