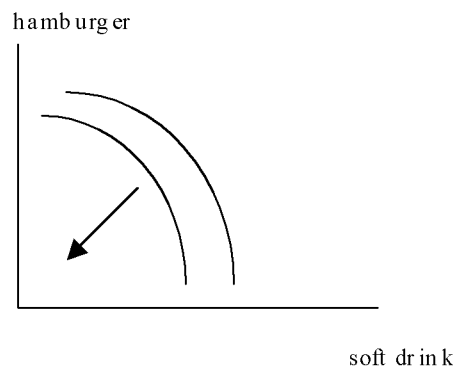


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2. Draw indifference curves that represent the following individuals' preferences for hamburgers and soft drinks. Indicate the direction in which the individuals' satisfaction (or utility) is increasing.

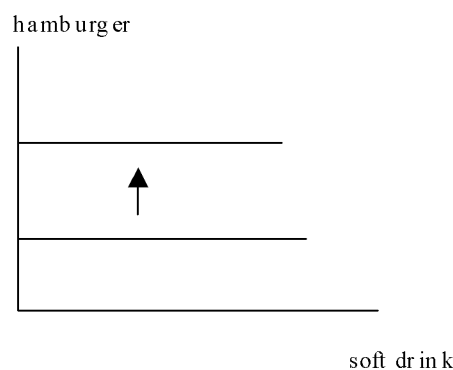
- a. **Joe has convex preferences and dislikes both hamburgers and soft drinks.**

Since Joe dislikes both goods, his set of indifference curves will be bowed inwards towards the origin instead of outwards, as in the normal case where more is preferred to less. Given he dislikes both goods, his satisfaction is increasing in the direction of the origin. Convexity of preferences implies his indifference curves will have the normal shape in that they are bowed towards the direction of increasing satisfaction. Convexity also implies that given any two bundles between which the consumer is indifferent, the "average" of the two bundles will be in the preferred set, or will leave him at least as well off.



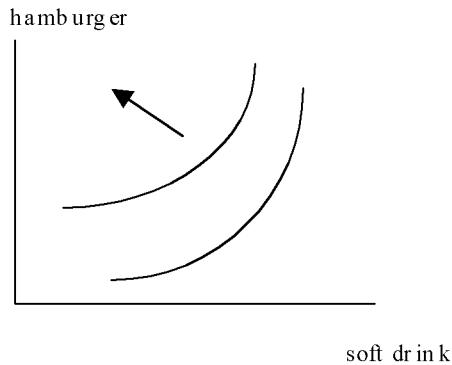
- b. **Jane loves hamburgers and dislikes soft drinks. If she is served a soft drink, she will pour it down the drain rather than drink it.**

Since Jane can freely dispose of the soft drink if it is given to her, she considers it to be a neutral good. This means she does not care about soft drinks one way or the other. With hamburgers on the vertical axis, her indifference curves are horizontal lines. Her satisfaction increases in the upward direction.

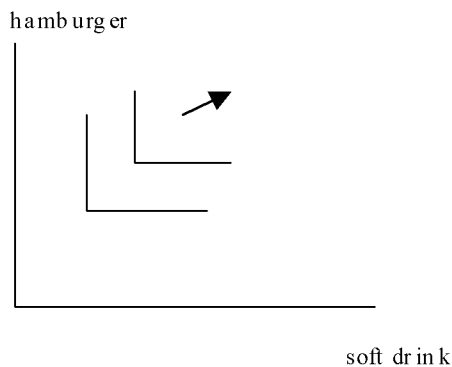


- c. **Bob loves hamburgers and dislikes soft drinks. If he is served a soft drink, he will drink it to be polite.**

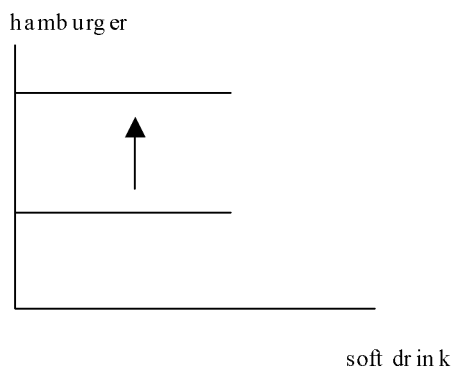
Since Bob will drink the soft drink in order to be polite, it can be thought of as a "bad". When served another soft drink, he will require more hamburgers at the same time in order to keep his satisfaction constant. More soft drinks without more hamburgers will worsen his utility. More hamburgers and fewer soft drinks will increase his utility.



- d. **Molly loves hamburgers and soft drinks, but insists on consuming exactly one soft drink for every two hamburgers that she eats.**
 Molly wants to consume the two goods in a fixed proportion so her indifference curves are L-shaped. For any given amount of one good, she gets no extra satisfaction from having more of the other good. She will only increase her satisfaction if she has more of both goods.



- e. **Bill likes hamburgers, but neither likes nor dislikes soft drinks.**
 Like Jane, Bill considers soft drinks to be a neutral good. Since he does not care about soft drinks one way or the other we can assume that no matter how many he has, his utility will be the same. His level of satisfaction depends entirely on how many hamburgers he has.



- f. **Mary always gets twice as much satisfaction from an extra hamburger as she does from an extra soft drink.**
 How much extra satisfaction Mary gains from an extra hamburger or soft drink tells us something about the marginal utilities of the two goods, or about her MRS. If she always receives twice the satisfaction from an extra hamburger then her marginal utility from consuming an extra hamburger is twice her marginal utility from consuming an

extra soft drink. Her MRS, with hamburgers on the vertical axis, is $1/2$. Her indifference curves are straight lines with a slope of $1/2$.

