1.5 Preferences II: MRS and Utility Functions - Practice Problems

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ECON 306 - Fall 2019

1. For each question, draw an indifference curve relating the two objects (label it I_1). Draw and label a *second* curve that gives *higher* utility (label it I_2), and a *third* curve that gives *lower* utility (label it I_0).

a. *Oranges* (a good) on the horizontal axis and *Pollution* (a bad) on the vertical axis.

b. *Pollution* (a bad) on the horizontal axis and *Oranges* (a good) on the vertical axis.

c. *Pollution* (a bad) on the horizontal axis and *Garbage* (a bad) on the vertical axis.

d. *Butter* on the horizontal axis and *Margarine* on the vertical axis. Both are goods, and you are always willing to trade between them at a 1:1 rate.

e. *Cars* on the horizontal axis and *Tires* on the vertical axis. Both are goods, and you are always want to consume them at a 1:4 proportion. (Draw these carefully!)

2. Suppose you can watch movies in the theater (t) and streaming at home (s), and earn utility according to the utility function:

$$u(t, s) = 4ts$$

Where your marginal utilities are:

$$MU_t = 4s$$
$$MU_s = 4t$$

a. Put t on the horizontal axis and s on the vertical axis. Write an equation for $MRS_{t,s}$

b. Would bundles of $(2, 2)$ and $(1, 4)$ be on the same indifference curve?

c. Is this curve convex? Hint: Does $MRS_{t,s} \downarrow$ as $t \uparrow$?

d. Sketch this indifference curve.