

Problem Set 4

Due Lecture 5 in class on paper

1. GLS Chapter 4, Question 3, but not part (b)

See pictures at end.

(a) Paul finds pencils and pens to be perfect substitutes.

Skip (b).

Because in (c) Emily prefers hip hop downloads to heavy metal, she is willing to give up a lot of heavy metal to gain even a little bit of hip hop.

(d) Cufflinks and dress shirts are complements for Michael. For every one dress shirt and two cufflinks, no additional cufflinks (by themselves) or additional dress shirts (by themselves) could make Michael any happier.

In (e), I assumed that shoes and pizza were complementary for Carlene, but not perfectly so. If you want to go out to eat pizza, you need shoes! Any logically argued answer is acceptable.

2. GLS Chapter 4, Question 13

(a) See picture at end.

I note that from the the facts of the problem, I can write

$$\begin{aligned} I &= P_X Q_X + P_Y Q_Y \\ I &= 4Q_X + 2Q_Y \end{aligned}$$

and also

$$MRS = \frac{MU_X}{MU_Y}$$

I choose an income of 12 for my picture.

(b) If you are maximizing your utility, it must be the case that

$$\begin{aligned}MRS &= \frac{P_X}{P_Y} \\ \frac{MU_X}{MU_Y} &= \frac{P_X}{P_Y}\end{aligned}$$

With the facts given, $MRS_{XY} = 4$, and $P_X/P_Y = 4/2 = 2$. Thus, the MRS is not equal to the ratio of the prices, and it cannot be that you are maximizing.

(c) At present, $MRS > P_X/P_Y$. This means that to maximize your utility you need to decrease the MRS (you can't do anything about prices! those are taken as given). To decrease the MRS , you need to make MU_X smaller relative to MU_Y (recalling that $MRS_{XY} = MU_X/MU_Y$). How do you make MU_X smaller? Recall that marginal utility diminishes in consumption. Thus, to make MU_X smaller, consume more of X (and less of Y , to balance your budget). This will decrease MU_X and increase MU_Y .

3. GLS Chapter 4, Question 14

(a) See picture at end. From the facts of this problem, we know that $I = P_l Q_l + P_b Q_b$, or that $100 = 20Q_l + 10Q_b$. If Andre spends all his money on laser tag, he can purchase 5 games; if he spends all his money on books, he can purchase 10 books.

(b) See picture at end. The indifference curve is tangent to the budget constraint where $Q_b = 6$.

(c) At $Q_b = 6$ (where Andre maximizes his utility), $MU_l = 12$. To find MU_b , recall that when utility is maximizing, it must be true that

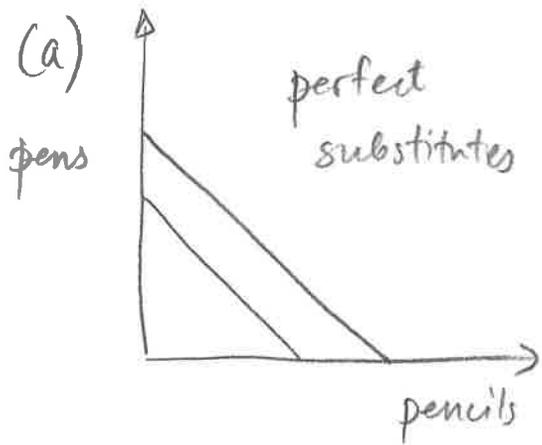
$$\frac{MU_b}{MU_l} = \frac{P_b}{P_l}.$$

Note that you know all the parts of this equation except MU_b , so that you can write

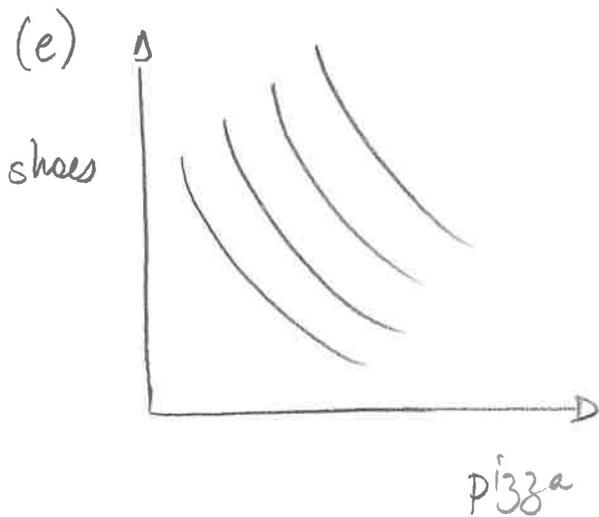
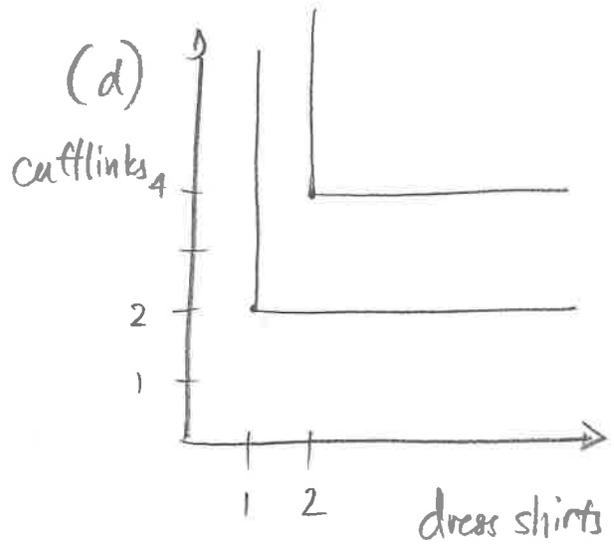
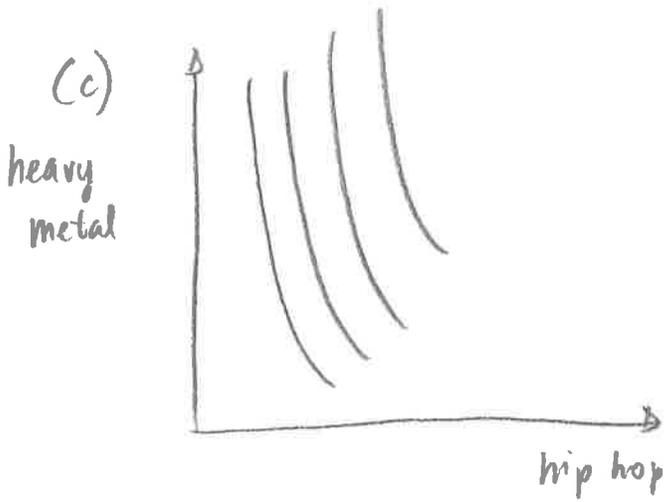
$$\frac{MU_b}{12} = \frac{10}{20},$$

and thus $MU_b = (0.5)12 = 6$.

GLS, Chapter 4, Q3

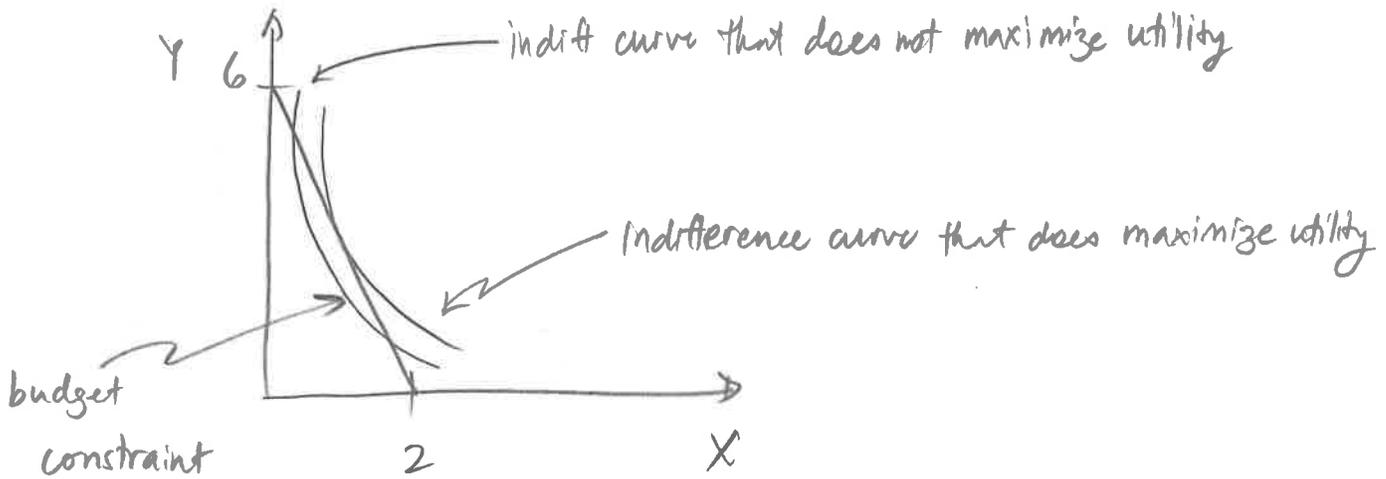


(b) n/e



GLS, Chapter 4, Q13

(a) Suppose income is 12. Then



GLS, Chapter 4, Q14

