

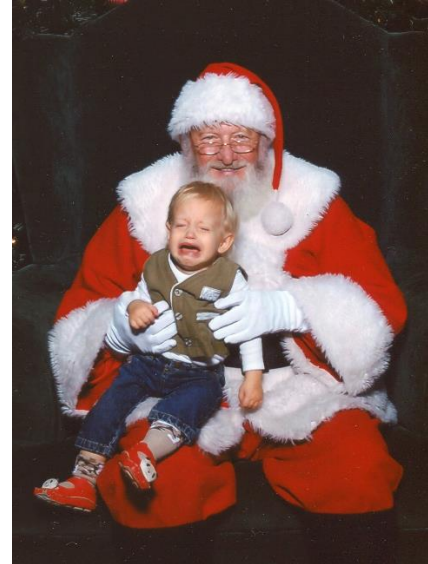
PROBLEM SET 1

Indifference curves and budget constraints

Instructions: Draw a graph to illustrate each of the following scenarios. Make sure you label the axes, all curves, and relevant points. Unlabeled curves/axes will be ignored (or worse) during grading. Unless otherwise indicated, assume the consumer's preferences are "well behaved."

1. Draw a graph illustrating your budget curve, assuming your budget dedicated to cell phone and plan is up to $I = \$200$. Use the composite good on the y-axis, and the phone data plan (show data in GB) you actually use on the x-axis. Ignore any taxes and fees charged.
2. Google's *Project Fi* phone service charges a \$20 flat monthly fee for the service. You pre-pay for data at a rate of \$10/GB.
 - a. Draw the budget line assuming the \$10/GB data fee is a flat rate (i.e., \$10 whether you use 1 MB or 999 MB.) Label this budget line "flat fee".
 - b. Draw the budget line assuming the data is divisible and refundable (i.e., you pay only \$5 if you use 500 MB, \$1 if you use 100 MB, or \$10 if you use 1 GB). Label this budget line "refundable".
3. Next create a new graph with your budget lines from (1) and (2b) on the same graph.
 - a. Draw an indifference curve for the typical consumer, and indicate which phone plan is preferable to the consumer.
 - b. Explain how you know the point you showed in (a) is the best option for the consumer.
4. Grandma gets upset by having technology that is too fast or that has too many options that she can't operate. As a result, she likes using phone minutes, but dislikes using phone data. (And just so it feels like a land-line phone, she always talks on the phone with the charging cord attached.)
 - a. Draw Grandma's budget line, with "talk minutes" on the y-axis and "data" on the x-axis. Assume her $I = \$100$, $P_{\text{minutes}} = 10\text{¢}/\text{min.}$, and $P_{\text{data}} = \$10/\text{GB}$. Also assume she only pays for the data she uses.
 - b. Now draw Grandma's indifference curve and show her optimal bundle of minutes and data use. Indicate which direction on the graph represents utility improvements.

5. The boy on Santa's lap considers "Christmas gifts" to be a neuter good, while he strongly dislikes "visits to Santa" (as shown in the picture, right). Draw the boy's indifference curve, showing "visits to Santa" on the y-axis and "Christmas presents" on the x-axis. Draw an arrow indicating the direction of utility improvement.



6. Brent Evans, assistant professor of economics (pictured right) likes playing poker and softball. He has a much stronger preference for poker, though, since he makes good money at that activity. Illustrate his indifference curve and draw an arrow to indicate the direction of utility improvement.

