

### Review Questions -- Utility

1. In 7<sup>th</sup> Heaven, Billy has \$7 to spend on Light Bulbs and Styling Gel. Light bulbs are 50 cents each; styling gel is \$1 each. Below are Billy's marginal utility schedules for light bulbs and styling gel.

Quantity Bought	MU Light Bulbs	MU Styling Gel
1	100	300
2	80	250
3	40	220
4	10	200
5	8	180
6	5	160
7	3	100

a) What quantities of light bulbs and styling gel should Billy buy if he is to maximize his total utility? Explain your answer in 1 sentence.

b) Calculate Billy's total utility after he has spent his \$7.

c) Illustrate Billy's utility-maximizing choice on a "budget constraint--indifference curve" graph. Include at least 6 numbers on your graph, including Billy's total utility.

2. Captain Kirk has spent his income on coffee and doughnuts in such a manner that after his income was exhausted, his marginal utility from his last coffee was 10 utils and his marginal utility from his last donut was 50 utils. Coffee is 75 cents per cup; donuts are \$1.50 each.

a) Has Kirk maximized his total utility? Explain, using the utility-maximizing rule.

b) If your answer to (a) was "no," then should Kirk have bought More or Fewer coffees? More or Fewer donuts? Explain in 1 sentence.

3. Uhura can work a maximum of 600 hours in a month at \$15 per hour; she chooses to work 120 hours per month.

Graph Uhura's income-leisure constraint, and her utility-maximizing income-leisure choice (a point on the constraint).

4. Bones has \$1500 dollars of income this year which he can either spend, or save (gaining 5% interest) so that he may spend it next year.

Graph Bones' intertemporal budget constraint.

**Answers**

1. In 7<sup>th</sup> Heaven, Billy has \$7 to spend on Light Bulbs and Styling Gel. Light bulbs are 50 cents each; styling gel is \$1 each. Below are Billy's marginal utility schedules for light bulbs and styling gel.

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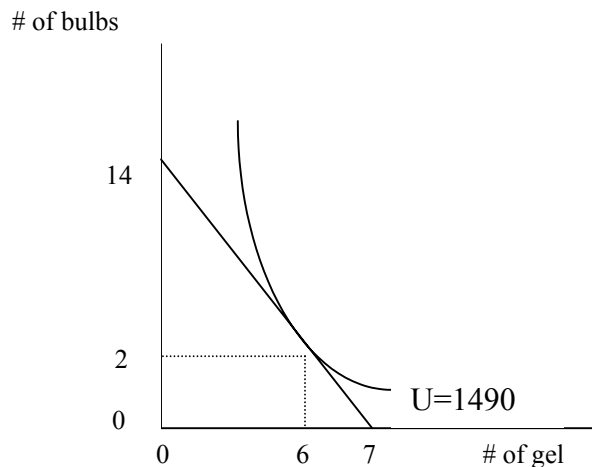
a) What quantities of light bulbs and styling gel should Billy buy if he is to maximize his total utility? Explain your answer in 1 sentence.

*He should buy 6 styling gel and 2 light bulbs. With this combination, he has spent his \$7 so that his marginal utility per dollar (MU/P) is the same for both goods.*

b) Calculate Billy's total utility after he has spent his \$7.

$$300+250+220+200+180+160+100+80=1490 \text{ utils}$$

c) Illustrate Billy's utility-maximizing choice on a "budget constraint--indifference curve" graph. Include at least 6 numbers on your graph, including Billy's total utility. (scale of graph is a bit off, due to limitations with Word drawing abilities)



2. Captain Kirk has spent his income on coffee and doughnuts in such a manner that after his income was exhausted, his marginal utility from his last coffee was 10 utils and his marginal utility from his last donut was 50 utils. Coffee is 75 cents per cup; donuts are \$1.50 each.

a) Has Kirk maximized his total utility? Explain, using the utility-maximizing rule.

*No. His  $MU/P$  for donuts does not equal his  $MU/P$  for coffee.*

$$MU/P \text{ for donuts} = 50/1.50 = 33.33$$

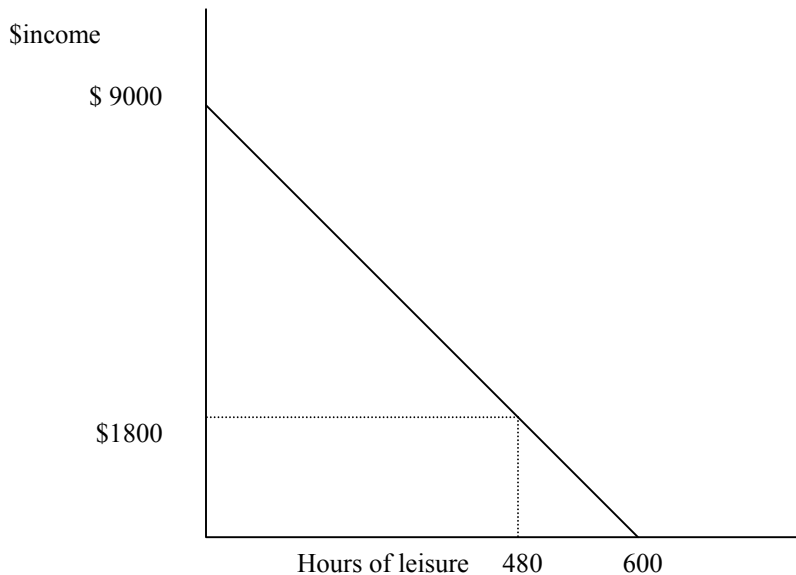
$$MU/P \text{ for coffee} = 10/.75 = 13.3333$$

b) If your answer to (a) was "no," then should Kirk have bought More or Fewer coffees? More or Fewer donuts? Explain in 1 sentence.

*Donuts were giving Kirk a higher  $MU/P$  than coffee, so he should have bought more donuts and less coffee.*

3. Uhura can work a maximum of 600 hours in a month at \$15 per hour; she chooses to work 120 hours per month.

Graph Uhura's income-leisure constraint, and her utility-maximizing income-leisure choice (a point on the constraint).



4. Bones has \$1500 dollars of income this year which he can either spend, or save (gaining 5% interest) so that he may spend it next year.

Graph Bones' intertemporal budget constraint.

