**Assignment 3 – Solutions**

**Chapter 6**

**1.5** (a) The equation for the original budget constraint is 16*X* + 20*Y* = $640.

(b) The price of an orchid is $16. The price of a fern is $20.

(c) The equation for the new budget constraint is 40*X* + 20*Y* = $640.

(d) The price of an orchid has risen to $40. The price of a fern is still $20.

**2.1**

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|  |  |
| --- | --- |
| # of Cookies | Marginal Utility |
| 1 | 100 |
| 2 | 100 |
| 3 | 75 |
| 4 | 50 |
| 5 | 25 |
| 6 | 10 |
| 7 | 0 |

The maximum he would buy is 7 because the seventh yields no marginal utility.

**2.3** (a)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cigars | | | | Brandy | | | |
| No. per Month | *TU* | *MU* | *MU/S* | Bottles per Month | *TU* | *MU* | *MU/S* |
| 1 | 28 | 28 | 4.67 | 1 | 150 | 150 | 5.00 |
| 2 | 46 | 18 | 3.00 | 2 | 270 | 120 | 4.00 |
| 3 | 62 | 16 | 2.66 | 3 | 360 | 90 | 3.00 |
| 4 | 74 | 12 | 2.00 | 4 | 420 | 60 | 2.00 |
| 5 | 80 | 6 | 1.00 | 5 | 450 | 30 | 1.00 |
| 6 | 84 | 4 | 0.67 | 6 | 470 | 20 | 0.67 |
| 7 | 86 | 2 | 0.33 | 7 | 480 | 10 | 0.33 |

(b) Yes, these figures are consistent with the law of diminishing marginal utility, which states that as the quantity of a good consumed increases, utility also increases, but by less and less for each additional unit. In the tables, the *TU* figures for both cigars and brandy are increasing, but as more cigars or more brandy are consumed, the *MU* diminishes.

(c) Four cigars and Four bottles of brandy. To maximize utility, the individual should allocate income toward those goods with the highest marginal utility per dollar. The first bottle of brandy has a higher marginal utility per dollar than the first cigar, so Kendrick begins by purchasing the first bottle of brandy for $30. The first cigar has a higher marginal utility than the second bottle of brandy, so now Kendrick should buy a cigar, for a total expenditure of $36. Next, Kendrick should buy the second bottle of brandy, for total spending of $66. This will continue until Kendrick purchases four cigars and four bottles of brandy, for total spending of $144.

(d) If the price of cigars rises to $9, only the *MU*/$ column for cigars needs to be recalculated:

|  |  |  |  |
| --- | --- | --- | --- |
| Cigars | | | |
| No. per Month | *TU* | *MU* | *MU/S* |
| 1 | 28 | 28 | 3.50 |
| 2 | 46 | 18 | 2.25 |
| 3 | 62 | 16 | 2.00 |
| 4 | 74 | 12 | 1.50 |
| 5 | 80 | 6 | 0.75 |
| 6 | 84 | 4 | 0.50 |
| 7 | 86 | 2 | 0.25 |

(e) Using the same logic as in part (c), Kendrick should purchase three cigars and four bottles of brandy, for a total expenditure of (3 × $8) + (4 × $30) = $144.

**1A.4** (a) We know that  We also know that  Substituting, we find that ; 

(b) If , ; and if , 

(c) Answers will vary, but the graph should show an indifference curve tangent to a budget constraint drawn for  and  = to one of the prices given in the answer to (b).

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