

National University of Singapore
Microeconomics III, EC4101(L1)
Tutorial 1 [Consumer Theory]
Lecturer: Parimal Bag

1. (To be presented by the assigned students.)

Central Secondary School has \$100,000 to spend on computers and other things. Hence, the school's budget equation is $C + X = 100000$, where C is expenditure in computers and X is expenditure on other things. Given this budget, Central Secondary School has submitted a current spending plan that proposes to spend \$40,000 on computers. The local educational council wants to encourage "computer literacy" in the schools under its jurisdiction. The following plans have been proposed.

Plan A. This plan would give a grant of \$20,000 to each school in the council's jurisdiction. The school could then spend the grant as it wishes.

Plan B. This plan would give a grant to \$20,000 to any school, as long as the school spends at least \$20,000 more on computers than it proposed in its current spending plan. Any school can choose not to participate, in which case it does not receive the grant but does not have to increase its proposed expenditure on computers.

Plan C. Plan C is a "matching grant". For every dollar that a school spends on computers, the council will give the school 50 cents.

Plan D. This plan is like plan C , except that the maximum amount of matching funds that a school can receive is limited to \$20,000.

1. As a first step in the analysis, draw four graphs representing Central Secondary School's budget set under each of the above four plans. Show the expenditure on computers in the horizontal axis, and the expenditure on other things, X , in the vertical axis. In each graph, draw also the Central secondary School's current budget constraint without any plan.
 2. Suppose now that the headmaster's preferences for expenditures on computers and other things are given by the utility function $U = C^2X^3$. First confirm that the headmaster would choose to spend \$40,000 on computers under the status quo. Now calculate how much the headmaster will choose to spend on computers under each of the four plans: A , B , C , and D . Which plan does the headmaster prefer? Which plan minimizes the local educational council expenditure?
2. **(This problem is for you to try. We will not discuss this due to time constraint.)**

Derive consumer's optimal choices of goods X_1 and X_2 as a function of their prices, p_1 and p_2 , and income, m , for the following utility functions:

$$U = ax_1 + bx_2 \quad (\text{substitutes})$$

$$U = \min\{ax_1, bx_2\} \quad (\text{complements})$$

$$U = x_1^{0.5} + x_2. \quad (\text{quasi-linear utility functions})$$

Obtain also the indirect utility function and the expenditure function.