

## Homework Problem #1

### Scarcity, Opportunity Cost, Values and Choice

PRINT YOUR NAME \_\_\_\_\_  
(LAST) (FIRST)

This assignment may be collected and evaluated by your instructor. Please answer all parts as briefly as possible. Write legibly and show any calculations that are appropriate.

Unfortunately for you, both your math and econ profs have decided to give tests two days from now (remember, this is a fictitious example). You have pondered the problem and realize that you can spend a **total of 9 hours** studying for **both** exams. Your real problem is to decide how to allocate your 9 hours (scarce resource) in studying for both exams (competing ends).

After some deep thought, you construct the following table to guide you in this decision. This table tells you what score you expect to get in each course, given the number of hours you might spend studying for each exam.

ECONOMICS		MATHEMATICS	
Number of Hours Studied	Expected Score	Number of Hours Studied	Expected Score
0	0	0	0
1	25	1	23
2	46	2	45
3	65	3	64
4	80	4	81
5	92	5	91
6	97	6	98
7	100	7	100

- A. The first problem is to decide what values you attach to the courses.
1. If econ has the highest priority, i.e., you want to get 100 on the econ exam, what will your score on the math test be? \_\_\_\_\_
  2. If math has the highest priority, i.e., you want to get 100 on the math exam, what will your score on the econ test be? \_\_\_\_\_
  3. Now suppose the minimum passing grade is 50 in each subject.
    - a. An **implicit** cost of getting 100 on the econ exam is to pass/fail math. (circle one)
    - b. An **implicit** cost of getting 100 on the math exam is to pass/fail econ. (circle one)

B. Suppose now, that instead of trying for 100 in one course, you want to get the highest possible combined score, using the 9 hours you have available for studying.

1. One way to proceed is to compare all different nine-hour combinations. To do this, complete the following table by filling in all of the blank spaces.

<u>Total Hours</u>		<u>Scores</u>		<u>Combined Score</u>
<u>Econ</u>	<u>Math</u>	<u>Econ</u>	<u>Math</u>	
<u>7</u>	<u>2</u>	<u>100</u>	<u>45</u>	<u>145</u>
_____	<u>3</u>	<u>97</u>	<u>64</u>	<u>161</u>
_____	<u>4</u>	_____	<u>81</u>	_____
_____	<u>5</u>	_____	<u>91</u>	_____
_____	<u>6</u>	_____	<u>98</u>	_____
<u>2</u>	_____	<u>46</u>	_____	<u>146</u>

What is the "best" allocation of study hours in terms of attaining the highest combined score? \_\_\_\_\_ hours econ and \_\_\_\_\_ hours math

2. An alternative method of finding the "best" allocation of study hours is to do what economists call "**working at the margin.**" (Note: This concept of marginal analysis appears in many places in economics. You may want to read the section on marginal analysis in Appendix I for a general explanation.) In order to utilize this method we must go back to our original tables and add a third column to each one as is done below. These columns, labeled "marginal increase" below, give the **CHANGE** in the expected score which will result from a one-hour **CHANGE** in study time spent upon each particular course.

<u>ECONOMICS</u>			<u>MATHEMATICS</u>		
<u>Hours</u>	<u>Scores</u>	<u>Marginal Increase</u>	<u>Hours</u>	<u>Scores</u>	<u>Marginal Increase</u>
0	0		0	0	
1	25	25	1	23	23
2	46	21	2	45	22
3	65	19	3	64	19
4	80	15	4	81	17
5	92	12	5	91	10
6	97	5	6	98	7
7	100	3	7	100	2