ECON 381 Midterm #1 Answer Key

Prof. Krauth, Spring 2012

True, false or uncertain (5 points each)

Explanations here were almost universally too long. The model answers I've given below are rarely more than a single sentence, and cover everything that I was looking for in an answer.

1. Uncertain. It depends on whether the income effect is large enough to offset the substitution effect.
2. There must be some wage at which an individual's labour supply is inelastic (or backward-bending). True. An individual's labour supply has an absolute physical limit (there are only 24 hours in a day), and so cannot be continually upward-sloping. *Many students didn't think of this factor, and instead explained why an individual's labour supply could be inelastic or backward-bending due to income effects. I gave full credit for this explanation as well*.
3. False. Men generally have less elastic labour supply than women.
4. False. The reservation wage is the wage below which a given worker will not work.
5. False *(uncertain would also be OK here, as long as the explanation is correct)*. For a worker that chooses not to work, the wage is less than or equal to the marginal rate of substitution between income and leisure.
6. True. Reducing the income level at which OAS claw-back begins will raise the implicit tax rate on labour income, and thus reduce labour supply. *In principle, the income effect could be large enough to offset the substitution effect (though this is empirically unlikely) and lead to the opposite effect. Some students wrote this and said uncertain – they received full credit. Other students presented that special case as if it were generally true and got no credit.*
7. True. Any explanation here would be fine.
8. False. Labour demand is generally less elastic in the short run than in the long run.
9. False. A profit-maximizing firm must make two decisions: how to produce a given quantity of the firm's good at lowest possible cost (cost-minimization) and how much to produce (supply).
10. Uncertain *(false would be OK here too, as long as the explanation is correct)*. Outsourcing to foreign countries reduces the demand for domestic workers if foreign and domestic workers are substitutes, but increases the demand for domestic workers if foreign and domestic workers are complements.

Problems

1. **(30 points)** This was by far the hardest question and most students did poorly on it. The essential skill here is to carefully draw the worker's budget set. If the budget set is right, then you are on your way to doing well on this question. If you don't have it right, then

there isn't much hope. Way too many students wasted their time drawing a picture, any picture, in hopes of getting a few points. In my class, this is not a wise use of your time.
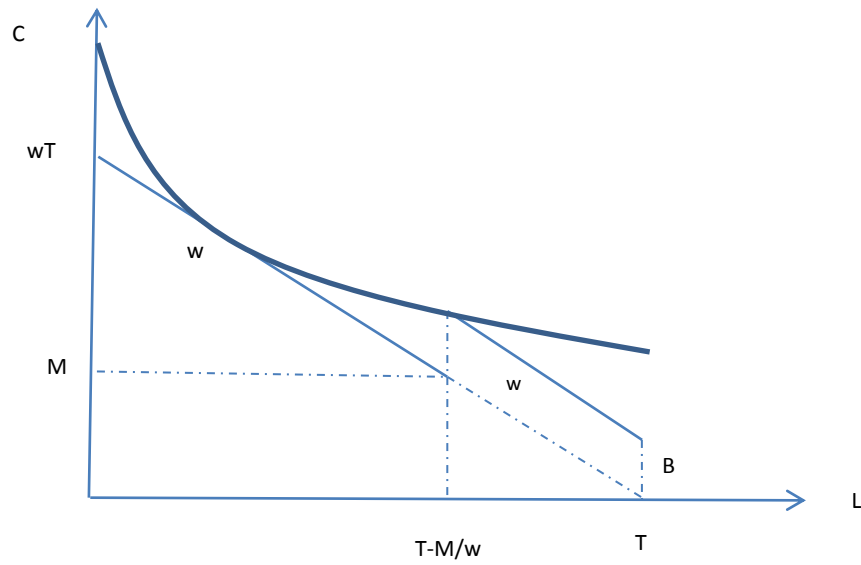
    a. (4 points) The worker's budget set over C and L looks like this:
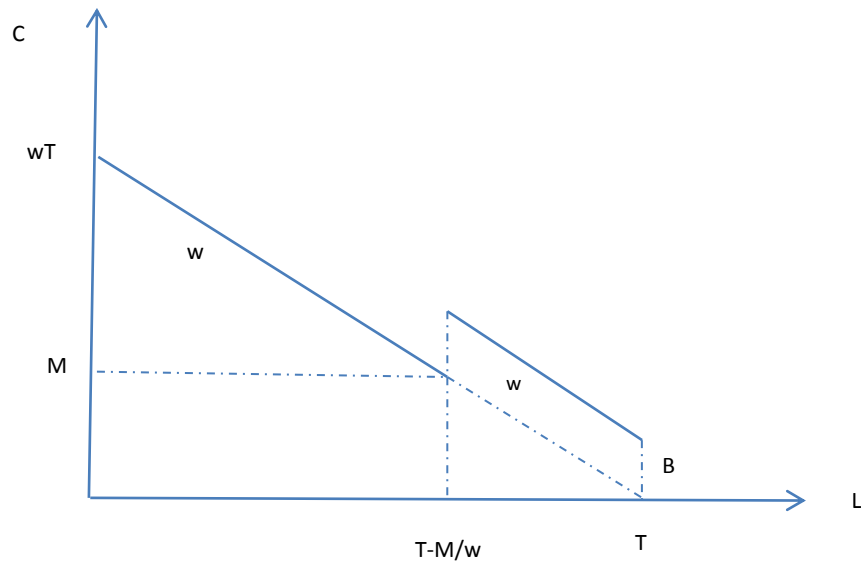

    b. (2 points) The implicit tax rate on labour market earnings below the threshold is zero.

    c. (2 points) The implicit tax rate on labour market earnings exactly at the threshold is infinity.

    d. (4 points) The worker's budget set and indifference curve for this case looks like this:

C

wT

M

T-M/w   T   L
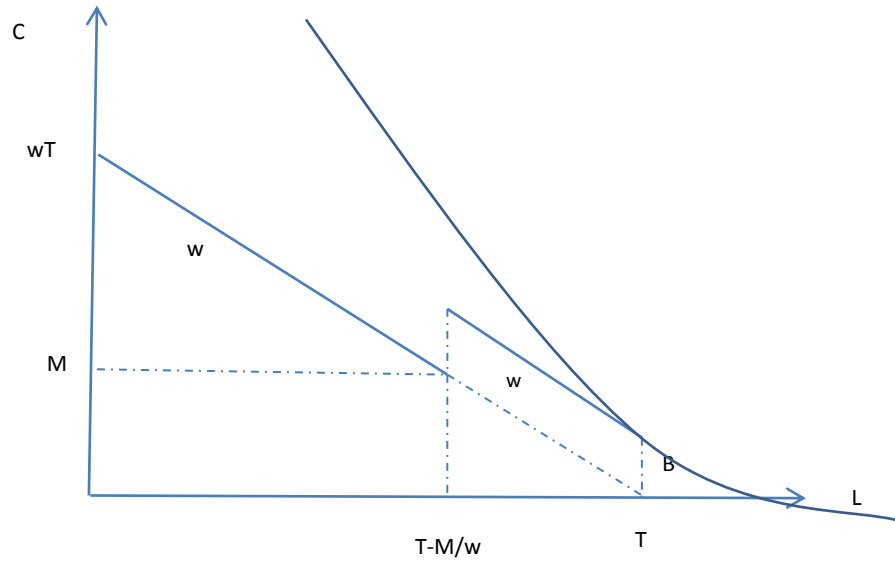
e. (4 points) The worker's budget set and indifference curve look like this:

C

wT

M

w

w

B

T-M/w   T   L

f. (4 points) The worker's budget set and indifference curve looks like this:

C

wT

w

M

w

B

T-M/w

T

L
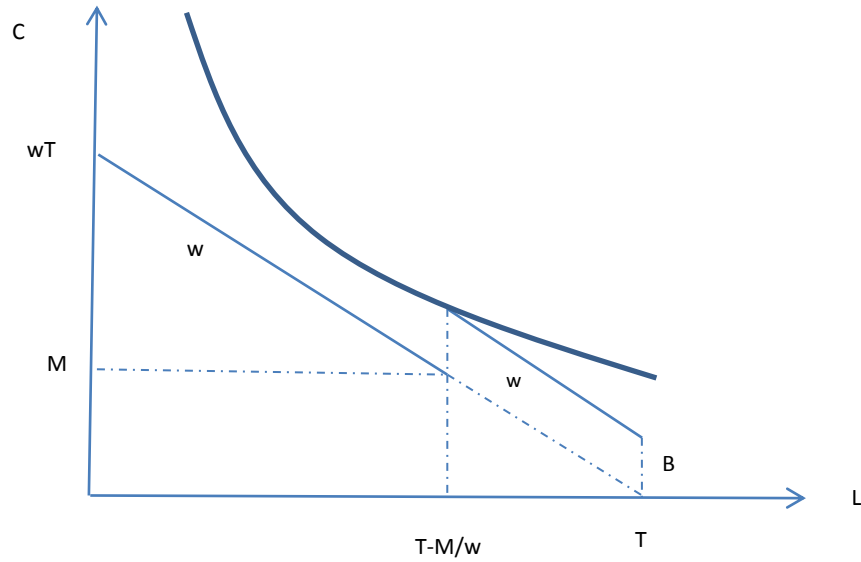
g. (3 points) The worker will decrease her labour supply. The reason for this is she will be supplying just enough labour to stay eligible $N=M/w$. If w goes up then M/w goes down.

h. (3 points) No. *Note that I didn't ask for an explanation, so anything you wrote other than "Yes" or "No" was a waste of your precious time.*

i. (4 points) The labour supply curve looks like this:

w

w_1

w_0

w_r

M/w_1

M/w_0

N_0

N
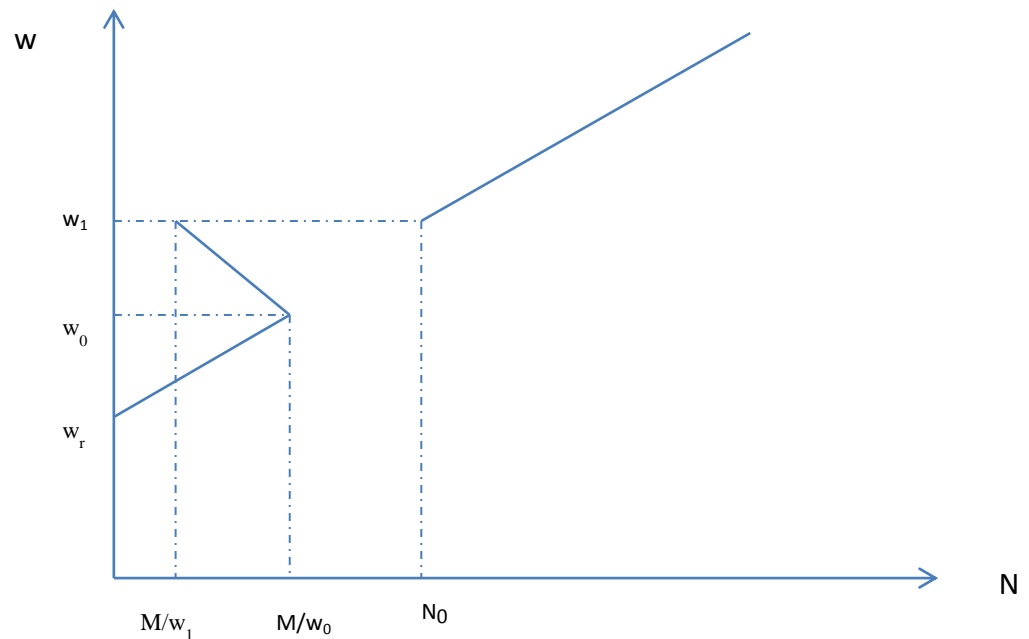
2. **(20 points)**
   a. (5 points) The marginal product of labour is $MPL=L^{-0.5}$.
   b. (5 points) The labour demand function is $L = 144/w^2$
   c. (5 points) Several students rounded their results here to the nearest integer. That's fine (though it wasn't necessary), but it is important to do this after calculation and not during calculation. For example, several students calculated labour demand of 1.44 at a wage of $10 and either rounded it up to 2 or down to 1, and then used that rounded number to calculate output and profits. This introduces large errors in those numbers.

Wage	Labour	Output	Profits
$1	144	24	144
$2	36	12	72
$5	5.76	4.8	28.8
$10	1.44	2.4	14.4

   d. (5 points) Profits go up when wages go down. This would be true even if firms didn't change their labour demand in response to the decrease in wages, so any change in labour demand in response to lower wages can only increase profits further.