MID-TERM I ECON302, (WHITE) February 22, 2007

Name:

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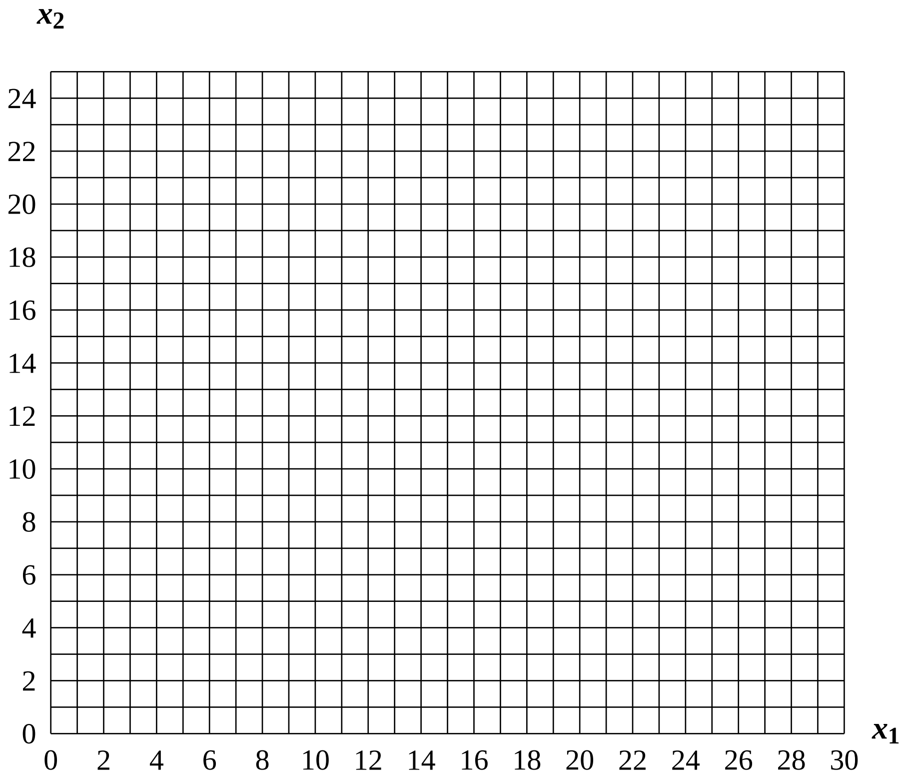
All questions must be answered on this test form!
For each question you must show your work and (or) provide a clear argument.
All graphs must be accurate to get credit.
If you need scratch paper, use the last page or the back of the form.

Question 1



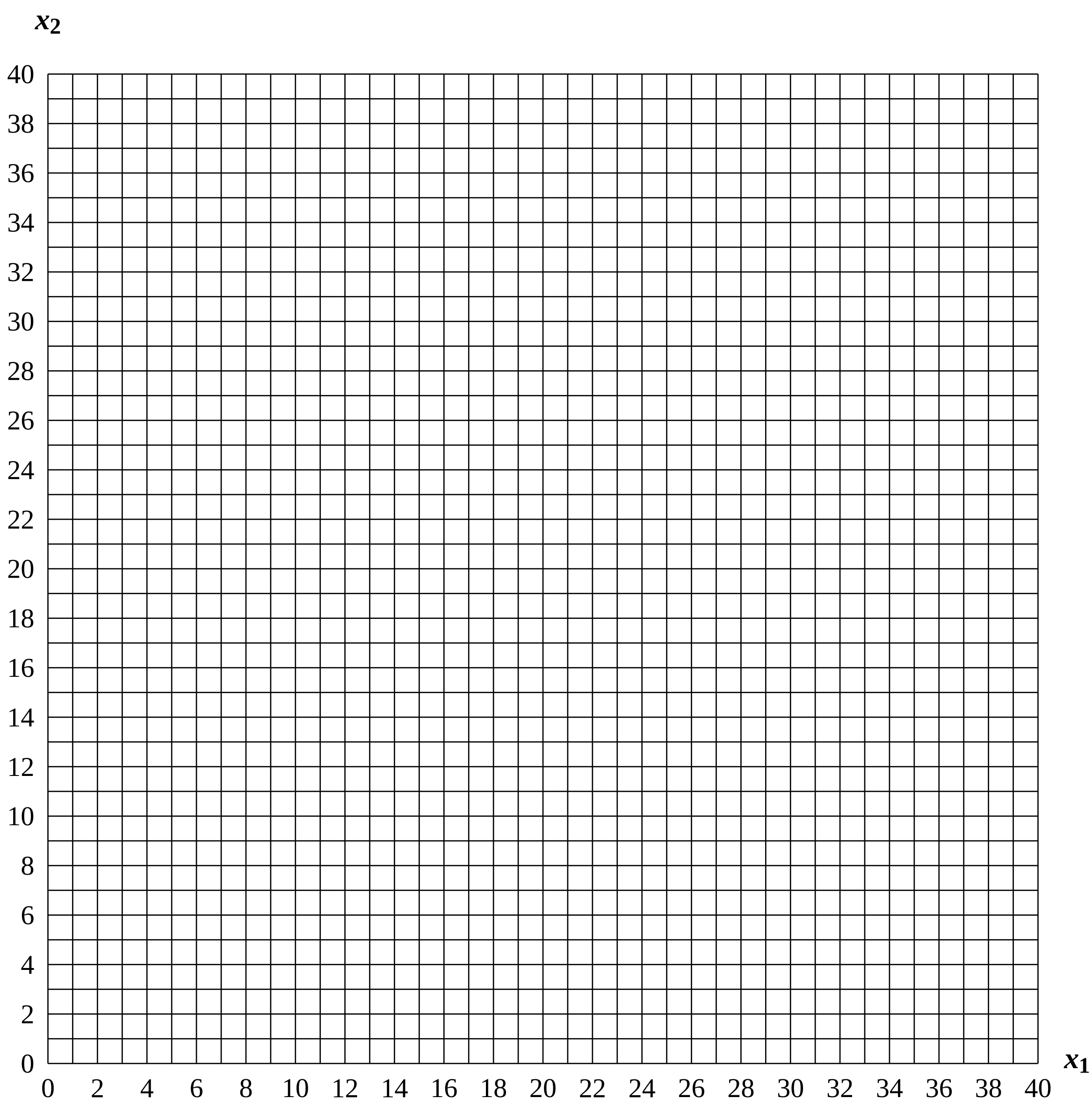
1. Suppose there are only two goods. If Joe spends all of of his income then he can afford 12 units of good 1 and 6 units of good 2. Furthermore, if he wants to purchase 2 units of good 1 and still remain on his budget line he must give up 3 units of good 2. Graph the budget line in the grid above. *5 points*

2. Suppose that Joe's income is $m = 96$. Then

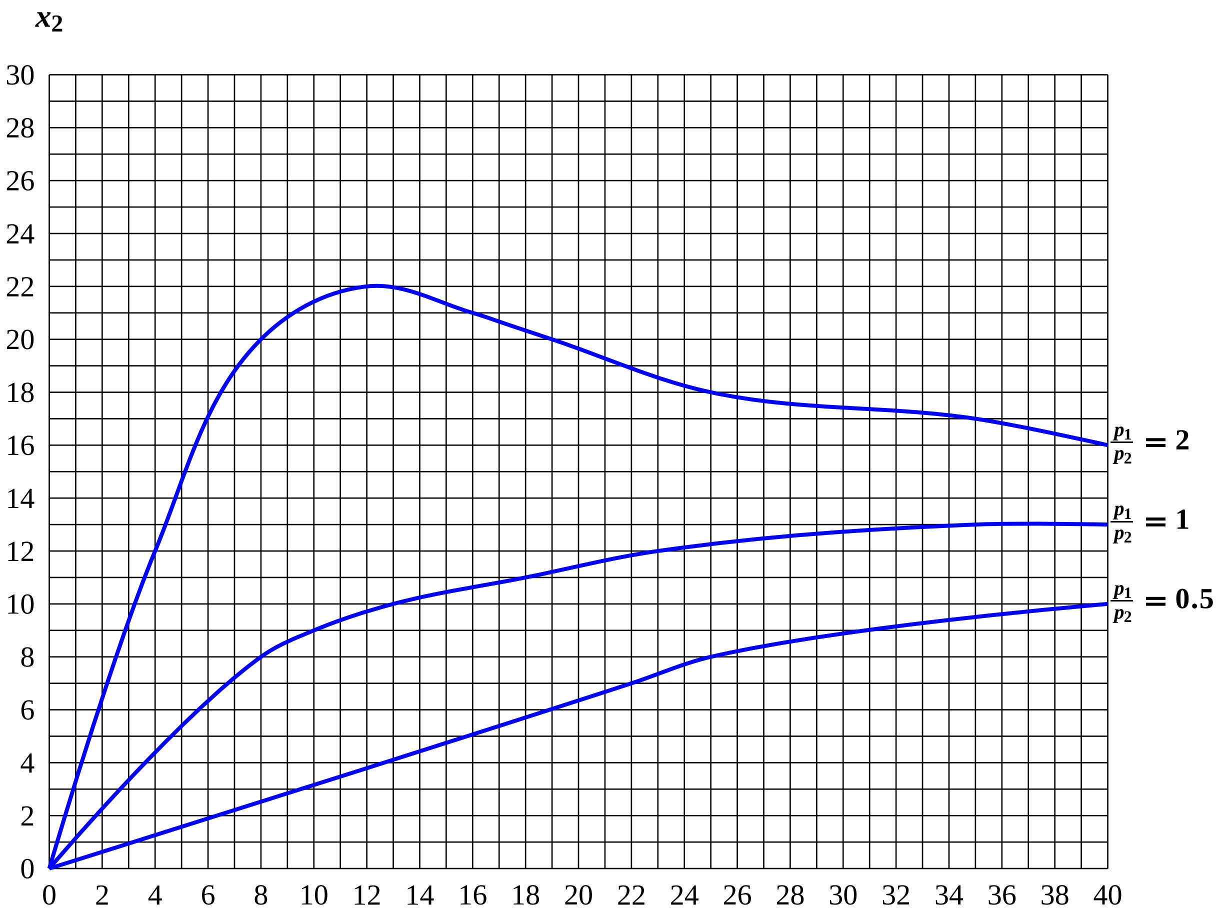
$\boxed{p_1 = \qquad\qquad , \ p_2 = \qquad\qquad}$ *5 points*

Question 2 Suppose that there are two goods. The price of each unit of good 2 is 2 Dollars. The price of good 1 depends on the quantity purchased. That is, if a person buys up to 5 units, then the price of each unit is 4 Dollars. If the person buys more than 5 units, then the first 5 units are still priced at 4 Dollars per unit, while each additional unit is priced at 1 Dollar per unit. Suppose that the person's income is $m = 50$. *10 points*

1. Graph the budget line using the grid below.
2. Clearly indicate the budget set by shading it.



Question 3 Income offer curves for different price ratios are depicted below. *10 points*



1. Suppose that income is $m = 58$ and prices are $p_1 = p_2 = 2$. Then optimal consumption is

$x_1 =$	$x_2 =$

2. Now suppose that the price of good 2 decreases to $p_2 = 1$. Income and the price of good 1 remain unchanged. Then optimal consumption is

$x_1 =$	$x_2 =$

Question 4

1. A utility function is given by $u(x_1, x_2) = x_1^3 x_2$. Then *5 points*

MRS =

2. Now suppose that the utility function is $u(x_1, x_2) = (x_1^{-1} + 2x_2^{-1})^{-1}$. Then *5 points*

MRS =

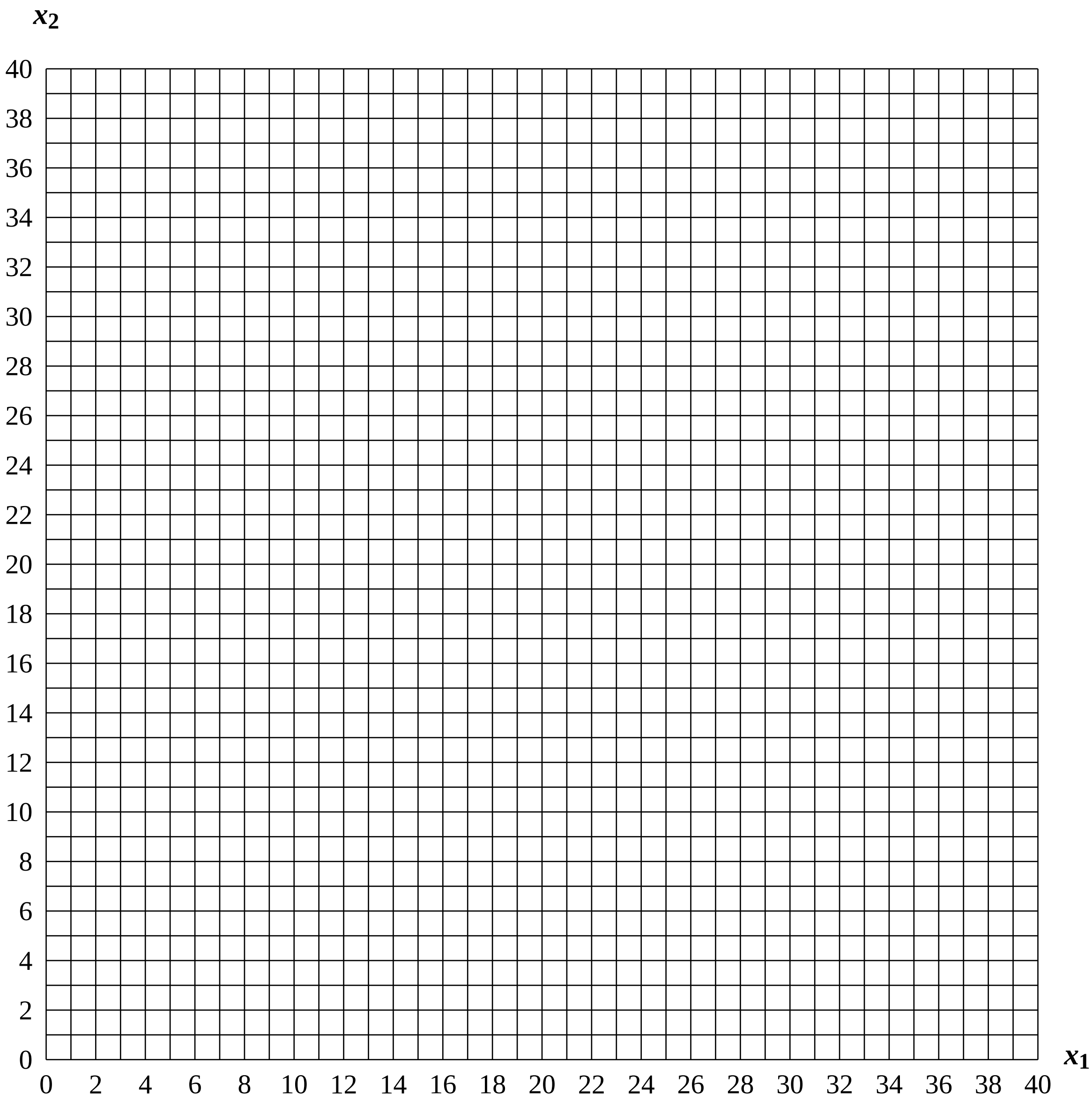
Question 5 A consumer's utility function is given by $u(x_1, x_2) = \min\{2x_1, 3x_2\}$. Assume that prices are $p_1 = 1$, $p_2 = 3$ and income is $I = 27$.

(a) Graph the budget line in the grid below. *5 points*

(b) Graph at least three indifference curves. *5 points*

(c) Graphically solve for the optimal consumption choice. *5 points*

At the optimal choice $x_1 =$ $x_2 =$



Question 6 A utility function is given by $u(x_1, x_2) = x_1 x_2^2$. Prices are $p_1 = 2$, $p_2 = 2$.

1. The equation of the income offer curve is *8 points*

   $\boxed{\boldsymbol{x_2 =} \qquad\qquad\qquad\qquad}$

2. Suppose that income is $m = 600$. Then optimal consumption is *7 points*

   $\boxed{\boldsymbol{x_1 =} \qquad\qquad , \boldsymbol{x_2 =} \qquad\qquad .}$

Question 7 Mary consumes only two goods and she has perfect substitutes preferences for them. Currently prices are $p_1 = 2$ and $p_2 = 4$, and she consumes 10 units of each good. We refer to this as the base case.

1. Suppose that the price of good 2 increases to $p_2 = 5$ everything else remains the same as in the base case. Then her optimal consumption is *5 points*

$\boldsymbol{x_1 =}$	$\boldsymbol{, x_2 =}$	.

   Note: There is enough information to solve this question.

2. Now suppose that p_1 increases to $p_1 = 4$, p_2 increases to $p_2 = 6$ and income increases by 50% compared to the base case.

   Then her optimal consumption is *5 points*

$\boldsymbol{x_1 =}$	$\boldsymbol{, x_2 =}$	.

   Note: There is enough information to solve this question.

Question 8 Joe's utility function is given by $u(x_1, x_2) = x_2 - 16(x_1 + 1)^{-1}$, where x_1 is the number of hours he spends in a gym and x_2 is money he spends on everything else. His income is $m = 1,000$. The price of good 2 is $p_2 = 1$

(a) Suppose that the gym charges 4 Dollars per hour, i.e., $p_1 = 4$. Then *7 points*

Joe's optimal choice of x_1 is

The gym's revenue (from Joe) is

(b) Now suppose that the gym charges a membership fee of 4 Dollars (this membership reduces income m by 4 Dollars), but with the membership the hourly price is now $p_1 = 1$. Then *8 points*

Joe's optimal choice of x_1 is

The gym's revenue (from Joe) is \$

The maximum membership fee F the gym can charge, at which Joe is just indifferent between going to the gym and not going to gym (not going means that $x_1 = 0$ and Joe does not pay the fee) is given by

***F* =**

Scratch Paper: Not Graded