Name:

E-mail:

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

Question 1 A utility function is given by $u(x_1, x_2) = x_1 x_2$. Originally, prices are $p_1 = p_2 = 1$ and wealth is $w = 360$ but increase to $p_1 = 4$ and $p_2 = 9$. Then *15 points*

The equivalent variation is given by $EV =$

(Recall that $e(p, u) = 2\sqrt{up_1p_2}$.)

Question 2 Suppose that an expenditure function is given by $e(p_1, p_2, u) = p_1 u^2$. Specify two different utility functions that generate this expenditure function. One of the utility functions must be convex and monotone. *14 points*

The quasiconcave & monotone utility function is $u(x_1, x_2)$ =

The other utility function is $u(x_1, x_2)$ =

Question 3 Let $X = \{a, b, c, d\}$ and suppose that a choice structure is given by

$$\mathfrak{B} = \{\{a, b, c\}, \{a, b\}, \{a, c, d\}\},$$

and

$$C(\{a, b, c\}) = \{c\},\ C(\{a, b\}) = \{a\},\ C(\{a, c, d\}) = \{c\}.$$

Specify two different preference orderings (for which preferences between any two choices are strict) that rationalize these preferences *12 points*

Preferences 1: (Insert $\succ$ or $\prec$)

a b	***a c***	***a d***	***b c***	***b d***	***c d***

Preferences 2: (Insert $\succ$ or $\prec$)

a b	***a c***	***a d***	***b c***	***b d***	***c d***

Question 4 Suppose that a utility function is given by

$$u(x_1, x_2) = \begin{cases} x_1 + x_2 & \text{if } x_1 + x_2 < 10; \\ 10 & \text{if } 10 \leq x_1 + x_2 \leq 20; \\ x_1 + x_2 - 10 & \text{if } 20 < x_1 + x_2. \end{cases}$$

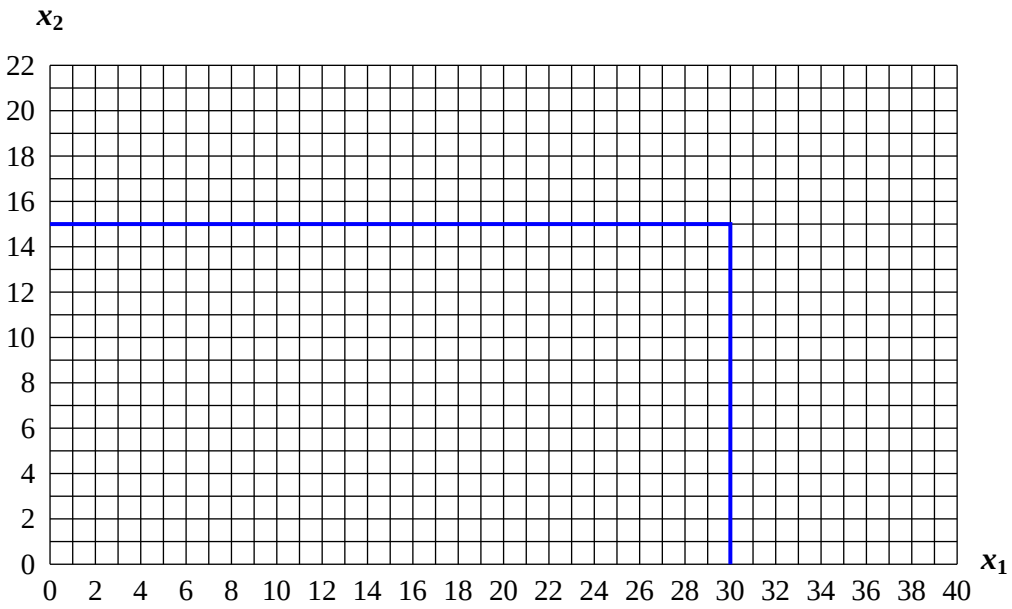
Suppose that prices are $p_1 = 1$, $p_2 = 2$. Find a numerical value for wealth, w, such that a (particular) solution, x_U^*, of the utility maximization problem given w does not correspond to a (particular) solution, x_E^*, of the expenditure minimization problem where the required utility in the expenditure minimization problem is $u = u(x_U^*)$. *12 points*

$w =$, $x_U^* = ($, $)$, $x_E^* = ($, $)$

Question 5 Suppose a utility function is given by $u(x_1, x_2) = \min\{2x_1, 4x_2\}$. Then *13 points*

$e(p, u) =$

Question 6 An indifference curve providing utility $u = 5$ for a monotone and homothetic preference relation is depicted below.



In the box below, describe the set of all prices at which the expenditure function $e(p, u)$ is not differentiable: *4points*

A monotone and quasiconcave utility function that generates exactly the same expenditure function is $\boldsymbol{u(x_1, x_2) =}$ *6 points*

Question 7 A utility function is given by $u(x_1, x_2) = \min\{2x_1 + x_2, x_1 + 2x_2\}$. Then (in the following Walrasian demand is denoted as usual by $x(p_1, p_2, w)$) *10 points*

$x(2, 2, 20) = ($, $)$

$x(2, 3, 60) = ($, $)$

$x(2, 5, 60) = ($, $)$

$x(2, 10, 60) = ($, $)$

$x(5, 3, 60) = ($, $)$

Question 8 Suppose that the consumption set is $X = \mathbb{R} \times \mathbb{R}_+$. An expenditure function is given by

$$e(p, u) = \frac{p_1(up_2 - p_1)}{p_2}.$$

Then *14 points*

$x_1(p, w) =$

(Note: The algebra in this question can take more time)

Scratch Paper: Not Graded

Scratch Paper: Not Graded

Scratch Paper: Not Graded