

MATHEMATICS AND STATISTICS 620-262 2003

ASSIGNMENT 10

DUE: FRIDAY, 24TH OF OCTOBER, 2003

Consider the Pareto linear programming problem

$$\begin{aligned}
 P- \quad & \max\{3x_1 + 5x_2 \quad , \quad 2x_1 - x_2\} \\
 \text{s.t.} \quad & x_1 \leq 6 \\
 & x_1 + x_2 \leq 12 \\
 & 3x_1 + 2x_2 \leq 20 \\
 & x_1, x_2 \geq 0.
 \end{aligned}$$

Find all Pareto extreme points and the corresponding objective function values, using the information that the linear programming problem below, for  $\beta = 0$ ,

$$\begin{aligned}
 P- \quad & \max\{3x_1 + 5x_2 + \beta(2x_1 - x_2)\} \\
 \text{s.t.} \quad & x_1 \leq 6 \\
 & x_1 + x_2 \leq 12 \\
 & 3x_1 + 2x_2 \leq 20 \\
 & x_1, x_2 \geq 0.
 \end{aligned}$$

has the optimal simplex tableau:

BV	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	RHS
$x_3$	1	0	1	0	0	6
$x_4$	$-\frac{1}{2}$	0	0	1	$-\frac{1}{2}$	2
$x_2$	$\frac{3}{2}$	1	0	0	$\frac{1}{2}$	10
$z$	$\frac{9}{2}$	0	0	0	$\frac{5}{2}$	50