Math 414 Hw 20 Name _____Score____/12

Hw 203: 8 Recommended 202: 1, 3, 7, 9, 11.

Problem 8, page 203. Recommendation: use MatLab — this is too long to do by hand.

State the canonical problem. List the last tableau of phase 1. List the last tableau of phase 2.

When making arbitrary choices in a column or row, pick the higher or leftmost.

When entering large matrices in MatLab, hit return after the ";". Matlab makes errors when it automatically wraps a line.

Save your matrix *a* to a matrix *z* to avoid reentering a in case of errors.

To calculate ratios for entering variable column 2, load('ratio') and enter: $c = 2;$ >ratio<

To check your answer with LinSolve enter the input with a text-editor. Save the LinSolve output to some file, then view the file with notepad or other text editor. Going from the primal min to the canonical max problem changes upward constraints to downward constraints and vice versa. *Thus the dual variables for the primal have the opposite sign as those of the canonical which appear in the tableau's bottom row. However, if the slack is negated in the canonical problem (i.e., an extra variable is added) then the dual variable's sign is also changed. If both changes occur, they cancel each other out. If an initial constant is negative, making it positive also changes the dual variable's sign.

8(12) PRIMAL: CANONICAL+ ("Canonical+" = canonical problem plus with extra variables.)

min $w = 8x + 6y + 11z$ max $-w =$

r: $5x + y + 3z \le 4$ r:

s: $5x + y + 3z \ge 2$ s:

t: $2x + 4y + 7z \le 5$ t:

u: $2x + 4y + 7z \ge 3$ u:

v: $x + y + z = 1$ v:

$x, y, z \ge 0$ $x, y, z \ge 0$

PRIMAL:

min $w =$ _____, when $x =$ _____, $y =$ _____, $z =$ ____, with slacks $r =$ _____, $s =$ _____, $t =$ _____, $u =$ _____ .

DUAL:

max $w =$ _____, when $r =$ ____, $s =$ _____, $t =$ ____, $u =$ ____, $v =$ _____with slacks $x =$ ____, $y =$ ____, $z =$ _____.

Make the sign changes for s and v' noted above *. One is changed, the other is not since it is changed twice.

Last tableau of phase one.

variables	x	y	z	s	u	r	s'	t	u'	v'	b
										0	
										-0.25	
										-4.5	
										1.25	
										4.5	
e										1	

Last tableau of phase two. Recall that the extra variable columns are deleted except when the equality constraint has no slack variable.

variables	x	y	z	s	u	r		t		v'	b
										0	
										-0.25	
										-4.5	
										1.25	
										4.5	
$-w$										-5.5	