Math 414 Hw 23 Name ________________________________ Score____/18

Recommended 233: 1.

1(5) Primal problem.
max $z = x + y$
with
r: .... ≤ 6
s: .... ≤ 5
t: .... ≤ 4 $\quad x, y \ge 0$

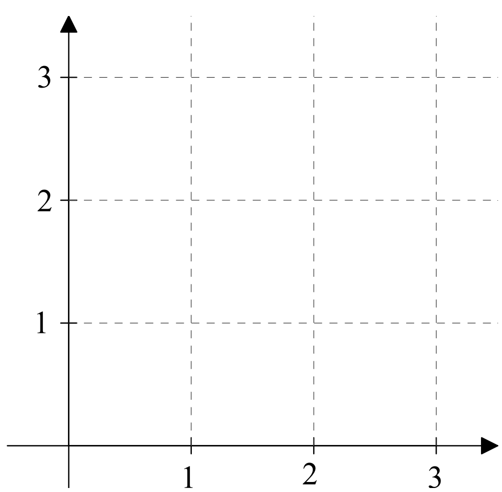
(a) List the initial basic variables.

(b) The constant coefficient vector B =

(c) Shade the submatrix T; complete the final tableau

		x	y	r	s	t	b
		1	0	1	0	-1	
		0	0	3	1	-5	
		0	1	-1	0	2	
	z						

2(2) Primal problem. Sketch the region
max $z = x + y$
with
r: $y \le 2$
s: $x + y \le 3$
t: $x \le 2$
$x, y \ge 0$



3(8)
Initial matrix

	x	y	r	s	t	b			(b)	(c)	(d)
r	0	1	1	0	0	2	→	p			
s	1	1	0	1	0	3	→	3			
t	1	0	0	0	1	2	→	2			
	-1	-1	0	0	0	0					

(a) Shade the submatrices T; complete the final tableau

x	y	r	s	t	B		(b)	(c)	(d)
0	1	1	0	0		→	p		
1	0	-1	1	0		→	$3-p$		
0	0	1	-1	1		→	$p-1$		
							3		

(b) Suppose $b_r = 2$ is replaced by the variable p. See columns (b). Write the optimal solution in terms of p and find the interval for which this solution is feasible.

max z =_________ at x = _________, y = __________

for $p \in$ ______________.

(c) Suppose $b_s = 3$ is replaced by the variable p. Fill in columns (c). Write the optimal solution in terms of p and find the interval for which this solution is feasible.

max z =_________ at x = _________, y = __________

for $p \in$ ______________.

(d) Suppose $b_t = 2$ is replaced by the variable p. Fill in columns (d). Write the optimal solution in terms of p and find the interval for which this solution is feasible.

max z =_________at x = __________, y = __________

for $p \in$ ______________.

Check your answers with LinSolve.
Enter the primal problem.
Answer "yes" to "Sensitivity analysis?".
Skip the first screen.
If the range of b_r is $p \in [\boldsymbol{a}, \boldsymbol{b}]$, then LinSolve answers
"... maximum basis does not change when right-hand side: ***r*** (ranges) from ***a*** to ***b***".

4(3) Solve using LinSolve.
max $z = y$ with
r: $-x + y \le 2$
s: $x + y \le 6$
t: $x - y \le 2$, $\quad x, y \ge 0$
Optimal solution. max $z=4$ when $x=2, y=4$.
Find the interval for which this solution is feasible if

(a) $b_r=2$ is replaced by the variable p. $p \in$

(b) $b_s=6$ is replaced by p. $p \in$