Math 414 Hw 24 Name ________________________________ Score____/12

Recommended 233: 2, 3

Primal problem.

max $z = ...$

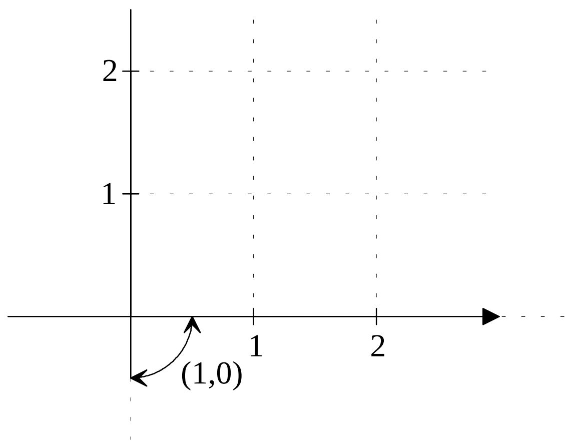
with

r: $-x + y \leq 1$

s: $x \leq 1$

$x, y \geq 0$

1(3) Sketch the region of feasible solutions and draw dotted lines to mark off the sectors consisting of objective vectors for which each extreme is optimal. Label the sectors with their optimal solutions. One segment has been done for you.



Suppose the objective function is max $z = x + y$. Then the final tableau is

		1	1	0	0	0
		x	y	r	s	b
1	y	0	1	1	1	2
1	x	1	0	0	1	1
	z	0	0	1	2	3

with solution max $z = 3$ at $x=1$, $y=2$.

2(3) What is the range for $c_x = 1$ such that $x=1$, $y=2$ remains optimal? Fill in the blanks, then give the answer.

				0	0	0
		x	y	r	s	b
	y	0	1	1	1	2
	x	1	0	0	1	1
	z					

The solution is optimal

iff

iff

Answer. The range is $c_x = p \in$

3(3) What is the range for $c_y = 1$ such that $x=1$, $y=2$ remains optimal? Fill in the blanks, then give the answer.

				0	0	0
		x	y	r	s	b
	y	0	1	1	1	2
	x	1	0	0	1	1
	z					

The solution is optimal

iff

iff

iff

Answer. The range is $c_y = p \in$

Check your answers with LinSolve. Enter the primal prob. Answer "yes" to Sensitivity analysis? On the first screen, If the range of c_r is [***a***,***b***], then LinSolve answers

"values ... in maximum do not change when objective coefficients: $\mathbf{c}_r$ (ranges) from ***a*** to ***b*** ".

4(3) Solve using LinSolve.

max $z = y$ with

r: $-x + y \leq 2$

s: $x + y \leq 6$

t: $x - y \leq 2$

The optimal solution is max $z=4$ when $x=2$, $y=4$.

Find the interval for which this solution is optimal if

(a) $c_x = 0$ is replaced by the variable p. $p \in$

(b) $c_y = 1$ is replaced by p. $p \in$