Math 414 Hw 27 Name ______________________________________ Score____/10

Recommended 275: 3, 4, 5, 6, 7.

1(4)
max $z = x+2y$ with

r: $x+y \le 5$

s: $-2x+2y \le 3$ $x,y\in N$

Fill in the final simplex tableau. Use LinSolve or MatLab to get it.

	x	y	r	s	b
x			0.5		
y			0.5		
z			1.5		

Add to this a floor row which represents a new constraint which cuts off the constant with the largest decimal part. The new constraint will be a ≤ inequality and thus you must also add a new slack variable, say t, and thus add a new column for this new variable. To do this in Malab first: load('insert'). Then enter:
row=< , , , , , >; >insert<. Write the <u>matrix</u> below.

	x	y	r	s	t	b
x			0.5			
y			0.5			
t			0			
z			1.5			

Note that one column associated with a basic variable is not an identity matrix column. Circle and pivot on the correct entry to make it an identity column. Fill in the resulting <u>tableau</u>.

	x	y	r	s	t	b
x			0.5			
y			0.5			
t			-0.5			
z			1.5			

Now the solution is optimal (no negatives in the z row) but not feasible (column b has a negative). Apply the dual method until feasibility is restored. Write the result (it won't necessarily be integral) below.

	x	y	r	s	t	b
x			0.66			
y			0.33			
s			0.66			
z			1.33			

Stop if the primal variables are integral. Otherwise repeat the process.

■ The linear programming problem for Problems 2 and 3.

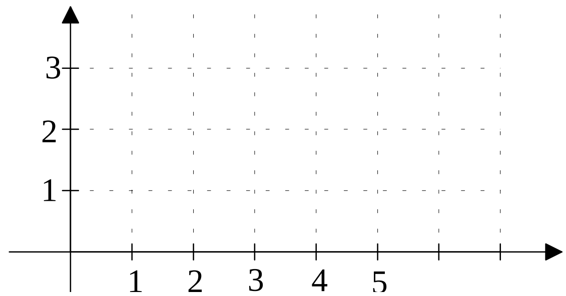
max $z = x+3y$

with r: $2y \le 3$

s: $x+2y \le 4$

$x, y \in N$

2(2) Sketch the region in the space below. Draw the objective vector. Circle the optimal integral solution.



3(4) Solve the problem using the cutting plane method.

- Initial simplex tableau.

	x	y	r	s	b
r	0	2	1	0	3
s	1	2	0	1	4
z	-1	-3	0	0	0

- Run the simplex algorithm and fill in the final tableau.

	x	y	r	s	b

- Fill in the <u>matrix</u> obtained by adding the new *cutting* constraint to the previous tableau. Add the constraint's line (use a dotted line) to the drawing in problem 2

	x	y	r	s	t	b

- Pivot on the basic variables to obtain a <u>tableau</u>.

	x	y	r	s	t	b

- Apply the dual simplex method to restore feasibility.

	x	y	r	s	t	b

Your answer should be: Max $z = 5$, at $x = 2$, $y = 1$.