Math 125 Quiz 5 Spring 201'	Math	125	Quiz	5	Spring	2017
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Discussion Time 8 9 10 11

- 1. A farmer is deciding how much of his land to plant in each of two crops: wheat and soybeans. He wants to plant at most 500 acres in total. Each acre of wheat requires \$30 in chemical cost. Each acre of soybeans requires \$40 in chemical cost. He can spend at most \$18,000 on chemicals. Each acre of wheat requires 2 gallons of fuel. Each acre of soybeans requires 4 gallons of fuel. He can use at most 800 gallons of fuel. Each acre of wheat yields a profit of \$100. Each acre of soybeans yields a profit of \$150. His goal is to maximize profit.
 - (a) (2 pts) Let x be the number of acres in wheat and y the number of acres in soybeans. Write all the constraints and the objective function corresponding to the above scenario.

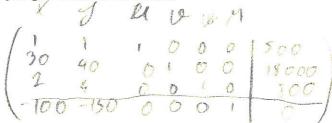
$$\begin{cases} x + y \le 500 \\ 30x + 40y \le 18000 \\ 2x + 4y \le 800 \\ x \ge 0, 9 \ge 0 \\ \text{maximize 100x+150y} \end{cases}$$

(b) (4 pts) Convert all of the above inequalites (except the non-negativity ones) and the objective function into equalites using slack variables.

$$X+y+4=500$$

 $30 \times +40 y +0 = 18000$
 $2 \times +4 y + 1 = 800$
 $-100 \times -150 y + 1 = 0$

(c) (4 pts) Construct the corresponding simplex tableau. Label the tableau appropriately. Do not PIVOT, just give and lable the tableau.



	$\int x$	u	z	u	v	w	M	1	. [10 - 10
	0	$\sqrt{\frac{y}{3}}$	1	1	2	0	0	36	36/3=13
2. A linear programming problem yields the following simplex tableau:	1	L	2	0	1	0	0	55	55
2. A linear programming problem yields the following simplex tableau:	0 (8	1	0	3	1	0	64	6418: 8
	0	$\left -6 \right $	-2	0	-4	0	1	10	, ,

(a) (2 pts) Find the particular solution corresponding to the simplex tableau.

(b) (1 pt) Identify the column to pivot on next. Why did you pick this column?

(c) (1 pt) Identify the element to pivot on next. Why did you pick this element?

(d) (2 pts) Pivot on this element with your calculator and write the new simplex tableau.

(e) (2 pts) Find the particular solution corresponding to this simplex tableau.

$$X = 47$$
 $M = 58$
 $y = 8$
 $z = 0$

- (f) (1 pt) Does this solution offer an optimal solution? Yes on No.
- (g) (1 pt) How did you determine your answer to question (f) ?

