

MA162: Finite mathematics

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SCHEDULE:

- HW B3 is due Sunday, Mar 7th, 2010.
- HW C1 is due Monday, Mar 29th, 2010.
- **Bring practice exam Mar 4th**
- Exam 2 is Monday, Mar 8th, 5:00pm-7:00pm.
- My office hours are Tuesday and Thursday, 2:30pm-4:00pm in CB63
- No class Mar 16th, Mar 18th (Spring Break)

Today we will cover 4.2: Dual problems

4.1: Quiz review

Maximize $P = 6x + 3y$ subject to $x + y \leq 10$, $2x + y \leq 15$, $x \geq 0$, $y \geq 0$.

x	y	u	v	P	RHS	(Ratio)
1	1	1	0	0	10	(10)
2	1	0	1	0	15	(7.5)
-6	-3	0	0	1	0	

Pivot column is x , pivot row is the second (v) with ratio $7.5 < 10$.
 Divide the second row by 2, $\frac{1}{2}R_2$. Then clear the rest of the x column with $R_1 - R_2$ and $R_3 + 6R_2$.

x	y	u	v	P	RHS		x	y	u	v	P	RHS
$\frac{1}{2}R_2 \rightarrow$	1	1	0	0	10		0	0.5	1	-0.5	0	2.5
	1	0.5	0	0.5	7.5	$R_1 - R_2$	1	0.5	0	0.5	0	7.5
	-6	-3	0	0	1	$R_3 + 6R_2$	0	0	0	3	1	45

Decision ($x = 7.5, y = 0$), Result $P = 45$, Slacks ($u = 2.5, v = 0$)

4.2: Minimization

- We solved maximization problems, like maximize $3x + 4y$ subject to $x + y \leq 5$ $x \geq 0, y \geq 0$
- Maximize profit using the available resources
- We want to solve minimization problems, like minimize $3x + 4y$ subject to $x + y \geq 5$
- Minimize costs while meeting production goals
- We solve this problems using a technique called duality
- We change a min problem into a related max problem

4.2: Motivation

- The production goals are what constrain a minimization problem
- They are the input variables of a maximization problem
- The costs form the objective function for minimization
- They are the constraints of a maximization problem
- We just switch things around.

Homework: Tricky homework type

- Struggling is good; don't worry, don't give up
- You should be able to do all of B3 (and should be halfway done)
Today we learned to do HW B3 #s 2,6,7,10
And we already learned #s 1,3,4,5,8,9,11,12
- There is a [solver](#) to help do the min/max problems more quickly.
It is picky, but maybe useful.
- Several of the problems are easy; you can do them today
- I am just waiting to help my students with homework
Tuesday and Thursday, 2:30pm-4:00pm, CB63
8 other MA162 instructors also want to help