Oct. 2/17

Linear Prog

The Following LP is degenerate:

$\max z = 5x_1 + 2x_2$

s.t. $x_1 + x_2 \leq 6$

$x_1 - x_2 \leq 0$

$x_1, x_2 \geq 0$

(when a LP is equal to zero, dont use simplex method)

z	x_1	x_2	s_1	s_2	RHS	Ratio
1	-5	-2	0	0	0	
0	1	1	1	0	6	6 = (6/1)
0	(1)	-1	0	1	0	0 = (0/1)
1	0	-7	0	5	0	
0	0	(2)	1	-1	6	3 = (6/2)
0	1	-1	0	1	0	N/A
1	0	0	3.5	1.5	21	
	etc...				3	
					3	

$+s_n \leq b_i$

$-e_i \geq b_i$

$\min z = 2x_1 + 3x_2$

s.t. $0.5x_1 + 0.25x_2 \leq 4$

$x_1 + 3x_2 \geq 20$

$x_1 + x_2 = 10$

Row 0 $\quad 2 - 2x_1 - 3x_2 = 0$

Row 1 $\quad 0.5x_1 + 0.25x_2 + s_1 = 4$

Row 2 $\quad x_1 + 3x_2 - e_2 = 20$

Row 3 $\quad x_1 + x_2 = 10$

Z	x_1	x_2	s_1	e_2	
-2	-3	0	0		
0.5	0.25	1	0		
1	3	0	-1	≥	$-e_2 = 20$
1	1	0	0		$e_2 = -20$

↳ must be ≥ 0

Z	x_1	x_2	s_1	e_2	a_2	a_3	RHS
-2	-3	0	0	0	0		
0.5	0.25	1	0	0	0		4
1	3	0	-1	1	0		20
1	1	0	0	0	1		10

Intro into the "Big M" method

Max problem, look at smallest number for ratio

Min problem, look at biggest number for ratio

Oct. 4/17

LINEAR PRO.

urs - unrestricted in sign (can't use simplex method)

$x_1 \geq 0$

x_2 urs ⟶ Let $x_2 = x_2' - x_2''$

$x_2' \geq 0$

$x_2'' \geq 0$