

## MATH 354: Homework 7

Due: March 10, 2022 at 11:00 am

1. Upcoming office hours are Monday March 7 3-4 pm and Thursday March 10 9-10 am.
2. Reading is still Sections 7.1-4 in Miller, or equivalently Section 2.1-2 in Kolman and Beck.
3. Use the simplex method to solve Problem 6 from Homework 1. [Recall that you already have the initial tableau from Problem 6 of Homework 6; you can start with that.]
4. Use the simplex method to solve Problem 4 from the sample midterm. [Recall that you already have the initial tableau from Problem 7 of Homework 6; you can start with that.]
5. Use the simplex method to solve the following linear programming problem: maximize  $z = x_1 + 3x_2 + 5x_3$  subject to the constraints

$$\begin{cases} 2x_1 - 5x_2 + x_3 \leq 3 \\ x_1 + x_3 \leq 5 \\ x_1, x_2, x_3 \geq 0 \end{cases}$$

6. Suppose you encounter the following tableau while working through the simplex algorithm, missing its objective row.

	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_6$	$x_7$	$z$	
$x_4$	0	0	2	1	$5/2$	0	0	0	6
$x_1$	1	0	5	0	-3	0	-2	0	2
$x_6$	0	0	3	0	4	1	-4	0	5
$x_2$	0	1	0	0	$3/2$	0	0	0	1

What basic feasible solution does this tableau correspond to? Determine the correct departing variable if the entering variable is (a)  $x_3$ , (b)  $x_5$ , (c)  $x_7$ .