University of Toronto
MATB61 – Linear Programming and Optimization

Quiz 7

First Name: .....
Last Name: .....
Student Number: .....

1) Find the cutting plane for the following problem.

$$\max \; x_1 + 4x_2$$

$$\begin{aligned} \text{subject to} \quad & x_1 + 2x_2 + 3x3 \leq 3 \\ & 3x_1 + 2x_2 + x_3 \leq 7 \\ & x_1, x_2, x_3 \geq 0, \text{ integer} \end{aligned}$$

where the final tableau for the related LP is:

	x1	x2	x3	x4	x5	
x2	0.5	1	1.5	0.5	0	1.5
x5	2	0	-2	-1	1	4
	1	0	6	2	0	6

and $x4$ and $x5$ are the slack variables of the constraints. [3 points]

2) Solve the IP problem using the branch and bound algorithm. [7 points]

$$\min \; x_1 - 2x_2$$

$$\begin{aligned} \text{subject to} \quad & 2x_1 + x_2 \leq 5 \\ & -4x_1 + 4x_2 \leq 5 \\ & x_1, x_2 \geq 0, \text{ integer} \end{aligned}$$