University of Toronto
MATB61 – Linear Programming and Optimization

Quiz 3

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

1) Given the LP program :

$$\max \; x_1 - 2x_2 + x_3$$

$$\begin{aligned} \text{subject to} \qquad & x_1 + 2x_2 + 3x_3 \leq 12 \\ & -x_1 + 3x_2 \leq 9 \\ & x_1, x_2, x_3 \geq 0 \end{aligned}$$

Identify whether each of the following is a basic solution, an extreme point, or neither. Show your steps [5.5 points].

(a) $[1, 3, \frac{5}{3}]$

(b) $[-1, \frac{8}{3}, 0]$

(c) $[3, 4, \frac{1}{3}]$

2) which of the following statements are true. [4.5 points].

(a) The number of basic feasible solutions of a canonical LP is $\frac{n!}{m!(m-n)!}$, where in $Ax = b$, A is a full rank $m \times n$ matrix and $m \leq n$.

(b) An extreme point is a basic solution.

(c) The set of solutions to an inequality constraint is a hyperplane.