4. (a) Use the Cyclic (*i.e.* the cutting plane) algorithm to solve the following integer linear programming problem :

$$\text{Maximise} \quad z = 3x_1 + x_2$$

Subject to :
$$3x_1 + x_2 \leq 10$$
$$x_1 + 2x_2 \leq 9$$
$$x_1, x_2 \geq 0$$
$$z, x_1 \text{ and } x_2 \text{ integer}$$

(b) Draw a graph to illustrate your solution from 4(a). Show all cuts generated and the solution obtained at each iteration.

(c) Explain how the Cyclic algorithm would handle any artificial variables that were basic at the end of phase 2.