Question 6 **(6 marks)**

(a) Solve the system of equations: (3 marks)

$$x + y + z = 4$$
$$x - y - z = 2$$
$$2x - 3y + z = 11.$$

The third equation in part (a) on page 8 is changed to $2x - ky + z = 11$ where k is a real constant. The first two equations remain unchanged.

Ryan decided to solve this changed system of equations and obtained correctly the statement $(k+1)\,y = -4$.

(b) Determine the value of the constant k so that the changed system of equations does not have a unique solution. (1 mark)

(c) For the value of k determined from part (b), state the geometric interpretation of the solution of the three simultaneous equations. (2 marks)