MAPLE Practice Quiz 7

1. Solve the following linear system by using row reduction and back substitution on its augmented matrix:

\[ \begin{align*}
2x_1 + 3x_2 + 4x_3 + 5x_4 + 6x_5 + 7x_6 &= 8 \\
3x_1 + 3x_2 + 4x_3 + 5x_4 + 6x_5 + 7x_6 &= 11 \\
4x_1 + 4x_2 + 4x_3 + 5x_4 + 6x_5 + 7x_6 &= 37 \\
5x_1 + 5x_2 + 5x_3 + 5x_4 + 6x_5 + 7x_6 &= 32
\end{align*} \]

Repeat the exercise with the rhs all equal 0.

2. Find the values of a and b for which the system of equations has
   i. a unique solution
   ii. an infinite number of solutions
   iii. no solution

\[ \begin{align*}
x_1 + x_2 + x_3 &= 6 \\
x_1 + 2x_2 + 3x_3 &= 10 \\
x_1 + 2x_2 + ax_3 &= b
\end{align*} \]

3. Find the values of b for which the system of equations has a solution. Then solve the system for each value of b.

\[ \begin{align*}
x_1 + x_2 + x_3 &= 1 \\
x_1 + 2x_2 + 4x_3 &= b \\
x_1 + 4x_2 + 10x_3 &= b^2
\end{align*} \]