**Important:** Whenever you use your calculator to reduce a matrix, always write down the matrix and then the row reduced form of the matrix, clearly indicating you used your calculator.

1. State the free variables and write the vector form of the solution to the following system.

$$\begin{array}{rrrrrl}
14w & +3x & +37y & -3z & -8t & = 67 \\
19w & +5x & +53y & -2z & -21t & = 96 \\
11w & +3x & +31y & -z & -13t & = 56
\end{array}$$

(over)

2. The flow diagram below represents the traffic flow in a roundabout.
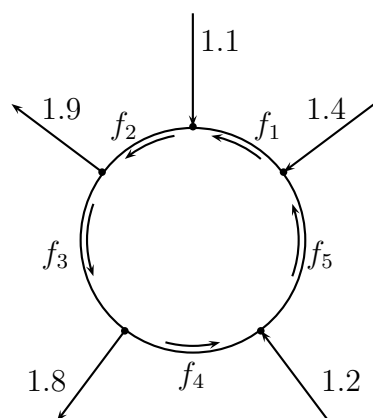
(a) Write down a system of equations defining the flows.

(b) Solve the system.

(c) If the flows are required to be counter-clockwise (as shown) what is the minimum flow rate for $\vec{f_1}$?