MORE EXAMPLES OF SECTIONS 1.1

Question 1. Solve the linear system:

$$\begin{cases} x & + & 3y & + & 2z & = & 2 \\ 2x & + & 7y & + & 7z & = & -1 \\ 2x & + & 5y & + & 2z & = & 7 \end{cases}$$

SOLUTIONS.

1. Subtract twice the first equation from the second one and replace the second equation by the result to get

$$\begin{cases} x & + & 3y & + & 2z & = & 2 \\ & & y & + & 3z & = & -5 \\ 2x & + & 5y & + & 2z & = & 7 \end{cases}$$

Subtract twice the first equation from the third one and replace the third equation by the result to get

$$\begin{cases} x & + & 3y & + & 2z & = & 2 \\ & & y & + & 3z & = & -5 \\ & & -y & + & -2z & = & 3 \end{cases}$$

Adding the last two equations

$$\begin{cases} x & + & 3y & + & 2z & = & 2 \\ & & y & + & 3z & = & -5 \\ & & & & z & = & -2 \end{cases}$$

Multiply the third equation by -3, add to the second one and replace the second equation with the result to get

$$\begin{cases} x & + & 3y & + & 2z & = & 2 \\ & & y & & & = & 1 \\ & & & & z & = & -2 \end{cases}$$

Multiply the third equation by -2, add to the first one to obtain

$$\begin{cases} x & + & 3y & & = & 6 \\ & & y & & = & 1 \\ & & & z & = & -2 \end{cases}$$

Multiply the second equation by -3 and add to the first one to finally obtain

$$\begin{cases} x & & & = & 3 \\ & y & & = & 1 \\ & & z & = & -2 \end{cases}$$

So the solution of the system is $x = 3$, $y = 1$, $z = -2$.