Problems for Lecture 1

1.

A combination of three nonzero vectors in $\mathbb{R}^4$ is the zero vector

$$\begin{bmatrix}1\\2\\1\\0\end{bmatrix}+\begin{bmatrix}1\\1\\2\\1\end{bmatrix}-\begin{bmatrix}2\\3\\3\\1\end{bmatrix}=\mathbf{0}$$

Form $A\mathbf{x}=0$

$$\begin{bmatrix}1&1&2\\2&1&3\\1&2&3\\0&1&3\end{bmatrix}\begin{bmatrix}1\\1\\-1\end{bmatrix}=\begin{bmatrix}0\\0\\0\end{bmatrix}$$

4.We can easily find $x=[1,-1,0]^T, y=[0,1,-1]^T, z=x+y$

9.$m=3, n\geq 3, r=3$

18.

$$\begin{bmatrix}1\\1\\\cdots\end{bmatrix}[0\quad\cdots\quad R]$$