Math 320 Linear Algebra Assignment # 3

1. For each of the following augmented matrices find the solution set in the form \vec{p} +span $(\vec{\beta_1}, \vec{\beta_2}, \vec{\beta_3}, \dots, \vec{\beta_k})$. (a)

| (a) | $\begin{bmatrix} 1 & 4 \\ 0 & 0 \\ 1 & 4 \end{bmatrix}$ | $2 \\ 0 \\ 2$ | $\begin{array}{c c c} 0 & 0 & 2 \\ 3 & 0 & 12 \\ 3 & 0 & 14 \end{array}$ |
|-----|---|------------------------|---|
| (b) | $\begin{bmatrix} 3 & 2 \\ 3 & 2 \end{bmatrix}$ | 2 5 2 2 | $\begin{array}{c cc} 4 & 1 & 0 \\ 1 & 3 & 0 \end{array}$ |
| (c) | | 4 2 1 3 5 3 3 | $\begin{array}{c c} 2 & 1 \\ 3 & 1 \\ 5 & 2 \\ -1 & 0 \\ 9 & 3 \end{array}$ |

- 2. Suppose that $\vec{u}, \vec{v} \in \mathbb{R}^m$ and $k \in \mathbb{R}$ show that:
 - (a) $\vec{u} \cdot \vec{v} = \vec{v} \cdot \vec{u}$
 - (b) $\vec{0_m} \cdot \vec{u} = 0$, where $\vec{0_m} \in \mathbb{R}^m$
 - (c) $k(\vec{u} \cdot \vec{v}) = (k\vec{u}) \cdot \vec{v} = \vec{u} \cdot (k\vec{v})$