Math 3260 Practice - Span

Question 1. Let $\vec{u} = \langle 2, 1 \rangle$ and $\vec{v} = \langle 1, -2 \rangle$.

(a) How many vectors are in the set $\{\vec{u}, \vec{v}\}$?

(b) How many vectors are in the set $\mathrm{Span}\{\vec{u}, \vec{v}\}$?

(c) Show that the vector $\vec{0}_2$ is in $\mathrm{Span}\{\vec{u}, \vec{v}\}$.

(d) Show that the vector $\langle 2, 0 \rangle$ is in $\mathrm{Span}\{\vec{u}, \vec{v}\}$ by finding weights c_1 and c_2 such that

$$\langle 2, 0 \rangle = c_1 \vec{u} + c_2 \vec{v}.$$

Question 2. Let $S = \{\vec{v}_1, \vec{v}_2, \vec{v}_3\}$ be any set of three vectors in R^5. Show that $\vec{0}_5$ is in $\mathrm{Span}(S)$. (Don't think deep thoughts about this.)