1. 請框出答案. 2. 不可使用手機、計算器，禁止作弊!

1. Prove that the given relation holds for all real matrices A and B if the expression is defined.

$$(AB)^T = B^T A^T$$

2. Determine whether the vector $\vec{b}$ is in the span of the vectors $\vec{v_i}$. If so, write $\vec{b}$ into the linear combination form.

   p.s. Please solve the problem with the corresponding augmented matrix. Also mark the row-echlon form and reduced row-echlon form of the augmented matrix.

   Answer: $\vec{b} =$ _____ $\cdot \vec{v_1} +$ _____ $\cdot \vec{v_2} +$ _____ $\cdot \vec{v_3}$

$$\vec{b} = \begin{bmatrix} 3 \\ 0 \\ 3 \end{bmatrix}, \vec{v_1} = \begin{bmatrix} 0 \\ -1 \\ 1 \end{bmatrix}, \vec{v_2} = \begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix}, \vec{v_3} = \begin{bmatrix} -1 \\ 2 \\ -3 \end{bmatrix}$$