Math 324 - Additional Problems HW#3

1. Prove the general version of Theorem 1.4.6:

   Suppose $A_1, A_2, \ldots, A_n$ are all invertible matrices of the same size. Show that for all $n \geq 2$,

   $$(A_1 A_2 \cdots A_n)^{-1} = A_n^{-1} \cdots A_2^{-1} A_1^{-1}.$$

2. Prove the general version of Theorem 1.4.8(e):

   Suppose $A_1, A_2, \ldots, A_n$ are matrices where the product $A_1 A_1 \cdots A_n$ can be found. Show that for all $n \geq 2$,

   $$(A_1 A_2 \cdots A_n)^{\mathrm{T}} = A_n^{\mathrm{T}} \cdots A_2^{\mathrm{T}} A_1^{\mathrm{T}}.$$