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Show all work. 5 points each.

1. Let  $T$  be the linear transformation  $T(x_1, x_2) = (x_1 - 2x_2, x_1 + x_2, -3x_1)$ . State what spaces (i.e.  $\mathbb{R}^n$ )  $T$  map from and to and find the standard matrix for  $T$ .

2. Let  $B = \begin{bmatrix} 7 & -5 & 1 \\ 1 & -4 & -3 \end{bmatrix}$  and  $C = \begin{bmatrix} 1 & 2 \\ -2 & 1 \end{bmatrix}$ .

Which computation can be performed  $2BC$  or  $-2CB$ ? Compute the one that makes sense.