2.1, 2.2, 2.3, 2.8 and 2.9 think-share-pair-compare

Part A: Post your responses in the think-share-pair-compare forum.

Part B: Respond separately to at least two of your classmates postings in a meaningful way that helps them understand. Try to select classmates who don't already have replies. Use their preferred name (like Dr. Sarah is mine), with something new that justifies your position on (at least) one of the questions. Don't just say, "Yeah, I agree." Instead, say, "Yes preferred name, but we also need to consider..." Or, "Preferred name, I had something different because..." You might pose questions, answer questions, extend ideas, or compare and contrast your responses and summarize what you chose and why.

1. List your preferred name.

2. Suppose the last column of AB is entirely zero but B itself has no column of zeros. What can you say about the columns of A?

3. Give an example of a matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ such that $ad - bc = 0$ and answer all of the following:

   (a) Are the columns of A linearly independent?

   (b) What does your answer to (a) imply about the number of solutions to $A\vec{x} = \vec{0}$?

   (c) Parameterize the nullspace of A in your notes. What is its dimension?

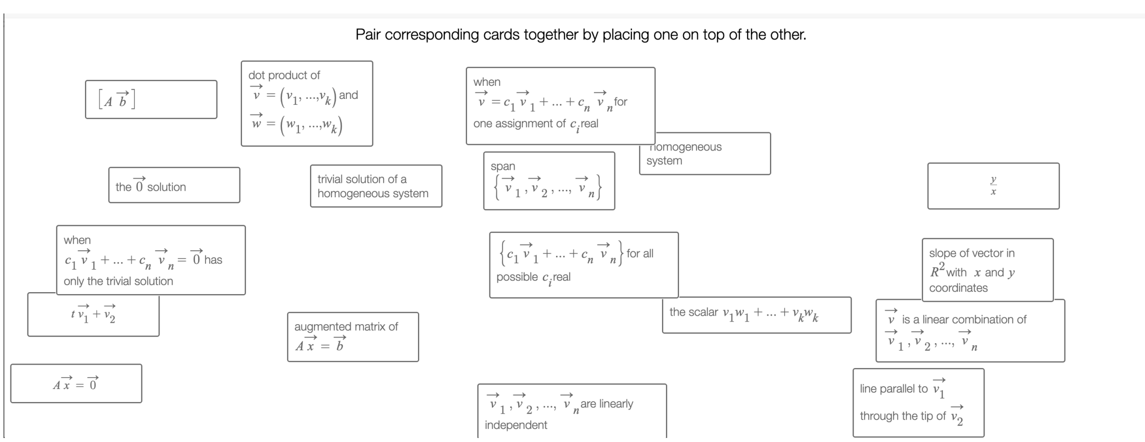
4. Look at $M = \begin{bmatrix} 1 & 4 \\ 2 & 5 \\ 3 & 6 \end{bmatrix}$. In your notes, determine the column space and null space by hand. Next, use your by-hand work to list a basis for the column space and a basis for the null space, if they exist. Finally, apply the rank-nullity theorem.

   In your posting, just list the following—fill in the blanks:

   rank M + nullity M = ____________________ + ____________________ = ____________________

   So it will look something like 1+ 2 = 3, but the relevant numbers for this matrix.

5. To help you solidify, pair corresponding cards together by placing one on top of the other at [link on ASULearn] (sign in to Desmos using your ASU Google account or similar). Next, use the feedback to keep sorting until you match them all correctly. Afterwards, select one or more pairings to describe and briefly report back in some way (for example, you could comment on what most interested, challenged or surprised you, or what you had a question on).



6. These sections include the following learning outcomes. Reflect on one or more of these—personal connections, experiences and/or questions you have.

    i. determine scalar multiples, transposes, sums, products and inverses of matrices
    ii. link matrix multiplication to matrix-vector products, systems of equations, and row operations
    iii. apply the inverse matrix theorem
    iv. determine the column space and nullspace and basis and dimension of subspaces of matrices
    v. apply the rank-nullity theorem
    vi. link algebra and geometry of the above, explore applications, and interpret statements