[Get 75% of students to turn on cameras]

[Turn on mic!]

Your exam scores are on Blackboard.

Key ideas from section 4.4?

Minsets vs. maxsets:

The minsets representation of $A \cup B$:

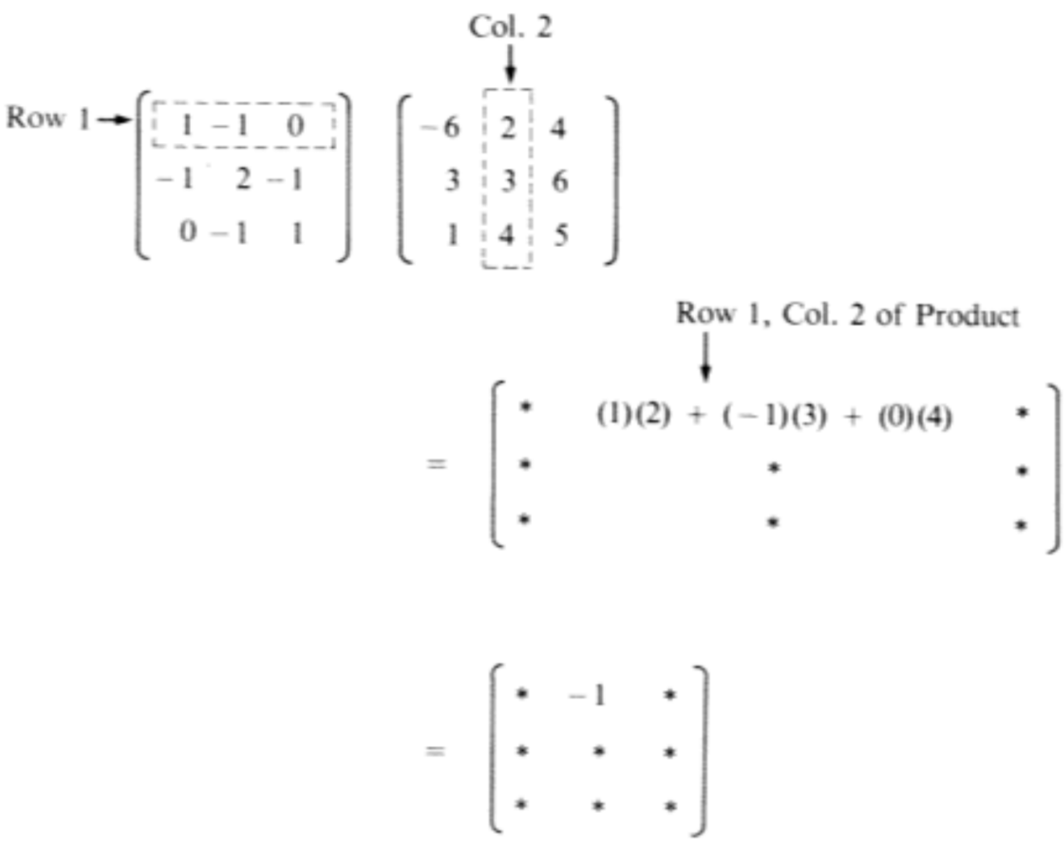
$$A \cup B = (A \cap B^c) \cup (A \cap B) \cup (A^c \cap B)$$

Dually, we have the maxset representation of $A \cap B$:

$$A \cap B = (A \cup B^c) \cap (A \cup B) \cap (A^c \cup B)$$

Section 5.1: Basic Definitions and Operations

- Know basic terminology: Matrix, entry, order, matrix equality, square matrix
- Perform any combination of the following operations on matrices: scalar multiplication, addition, subtraction, multiplication, matrix powers



Questions on section 5.1?

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Group work: 5.1.1(a,b,c,d). (10 min)

Let $A = \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$, $B = \begin{pmatrix} 0 & 1 \\ 3 & -5 \end{pmatrix}$, and $C = \begin{pmatrix} 0 & 1 & -1 \\ 3 & -2 & 2 \end{pmatrix}$

(a) Compute AB and BA.

(b) Compute $A + B$ and $B + A$.

(c) If $c = 3$, show that $c(A + B) = cA + cB$.

(d) Show that $(AB)C = A(BC)$.

..?..

(a) $AB = \begin{pmatrix} -3 & 6 \\ 9 & -13 \end{pmatrix}$ $BA = \begin{pmatrix} 2 & 3 \\ -7 & -18 \end{pmatrix}$

(b) $\begin{pmatrix} 1 & 0 \\ 5 & -2 \end{pmatrix}$

(c) $\begin{pmatrix} 3 & 0 \\ 15 & -6 \end{pmatrix}$

Since $(AB)C = A(BC)$ we often write just ABC.

Other questions on sections 5.1?

Section 5.2: Special Types of Matrices

- Know basic terminology: diagonal matrix, identity matrix, matrix inverse
- Be able to verify if a matrix is the inverse of another matrix using the definition.

Questions on section 5.2?

Group work: 5.2.2(a,b). (10 min)

2. For the given matrices A find A^{-1} if it exists and verify that $AA^{-1} = A^{-1}A = I$. If A^{-1} does not exist explain why.

(a) $A = \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix}$

(b) $A = \begin{pmatrix} 0 & 1 \\ 0 & 2 \end{pmatrix}$

Other questions on section 5.2?

Note: We don't write A/B for the product of A and B^{-1}. Likewise we don't write $1/A$ for A^{-1}.

Whenever the number of columns of A equals the number of rows of B (so that the product AB makes sense), we have $(cA)B = c(AB)$, so a kind associative property holds, and we can just write cAB without worrying about ambiguity.

In particular, $((1/3)A)B = (1/3)(AB)$, so if you had to take the answer to 5.2.2(a) and multiply it by some integer matrix, you can factor out $c = 1/3$ and do integer arithmetic computing AB and only divide by 3 at the last step.

We also have $cAB = AcB$, so we might informally say that scalars and matrices commute with each other.

Section 5.2 talks about how to compute 2×2 determinants;

https://applieddiscretestructures.blogspot.com/2019/01/appendix-on-determinants.html

talks about how to compute 3×3 determinants.