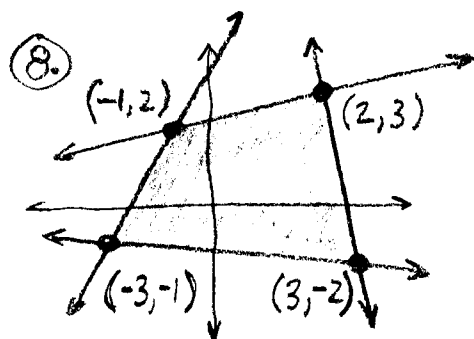


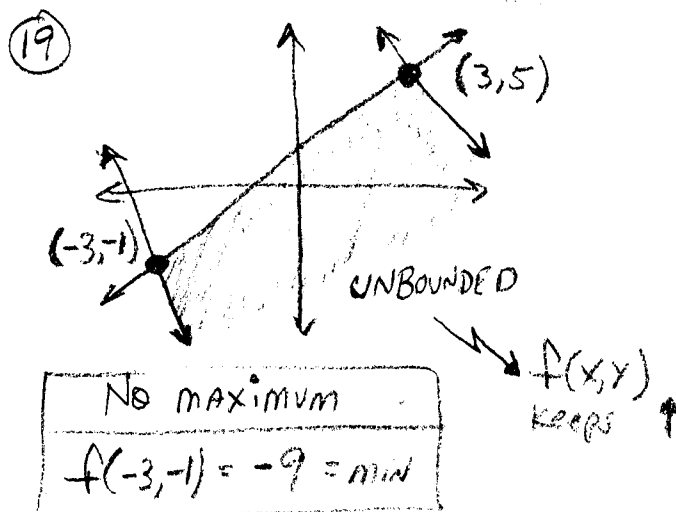
BE-Alg. 2 WEDNESDAY 9-23-09

3min ACT $\Rightarrow$ 3 problems $\Rightarrow$ Linear Programming

• Homework review: Pg 132 #8, 19
Pg 156 #1, 6, 7, 10-15



$f(3, -2) = 5 = \text{MAX}$
$f(-1, 2) = -3 = \text{min}$



NO MAXIMUM
$f(-3, -1) = -9 = \text{min}$

① Same dimensions, corresponding elements equal.

⑥ $\begin{bmatrix} 5 & 6 \end{bmatrix}$ ⑦ $\begin{bmatrix} 3 & 3 \end{bmatrix}$ ⑩ $\begin{bmatrix} 2 \times 3 \end{bmatrix}$ ⑪ $\begin{bmatrix} 3 \times 1 \end{bmatrix}$

⑫ $\begin{bmatrix} 4 \times 3 \end{bmatrix}$ ⑬ $\begin{bmatrix} 3 \times 3 \end{bmatrix}$ ⑭ $\begin{bmatrix} 2 \times 5 \end{bmatrix}$ ⑮ $\begin{bmatrix} 3 \times 2 \end{bmatrix}$

Ch. 4-2 OPERATIONS WITH MATRICES

ADD/SUBTRACT $\Rightarrow$ +/- corresponding elements.

+/- two matrices of different dimensions
is UNDEFINED.

$$\textcircled{\text{EX}} \quad A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 6 \\ 7 & -8 \end{bmatrix} \quad A+B = \begin{bmatrix} 6 & 8 \\ 10 & -4 \end{bmatrix}$$
$$A-B = \begin{bmatrix} -4 & -4 \\ -4 & 12 \end{bmatrix}$$

SCALAR = A number

Multiplying A matrix by a scalar:

$$\textcircled{\text{EX}} \quad A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \quad 3A = \begin{bmatrix} 3 & 6 \\ 9 & 12 \end{bmatrix}$$

$$\textcircled{\text{EX}} \quad 5A - 2B = \begin{bmatrix} 5 & 10 \\ 15 & 20 \end{bmatrix} - \begin{bmatrix} 10 & 12 \\ 14 & -16 \end{bmatrix} = \begin{bmatrix} -5 & -2 \\ 1 & 36 \end{bmatrix}$$
$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 6 \\ 7 & -8 \end{bmatrix}$$

MULTIPLY MATRICES $\Rightarrow$ Ch. 4-3

- CAN ONLY MULTIPLY IF COLUMNS OF 1ST MATRIX = ROWS OF SECOND MATRIX!

(EX) $[3 \times 2] \cdot [2 \times 4]$ OK

$\uparrow$ $\uparrow$
 COLUMNS = rows

$[3 \times 2] \cdot [3 \times 3]$ NOT DEFINED

$\uparrow$ $\uparrow$
 COLUMNS $\neq$ rows

- Dimensions of Product Matrix Will be same as Rows of First $\times$ Cols of 2ND

(EX) $[3 \times 2] \cdot [2 \times 4] = [3 \times 4]$

$\uparrow$ $\uparrow$
 ROWS OF 1ST COLS OF 2ND

How TO MULTIPLY:

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix} \cdot \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \end{bmatrix}$$

Check:

$$3 \times 2 \cdot 2 \times 4 \checkmark$$

Result

$$3 \times 4$$

Tip 2ND MATRIX ON END - MULTIPLY & ADD AS SHOWN

$$4 \ 8$$

$$3 \ 7$$

$$2 \ 6$$

$$1 \ 5$$

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix} \Rightarrow \begin{bmatrix} (1 \cdot 1) + (2 \cdot 5) & (1 \cdot 2) + (2 \cdot 6) & (1 \cdot 3) + (2 \cdot 7) & (1 \cdot 4) + (2 \cdot 8) \\ (3 \cdot 1) + (4 \cdot 5) & (3 \cdot 2) + (4 \cdot 6) & (3 \cdot 3) + (4 \cdot 7) & (3 \cdot 4) + (4 \cdot 8) \\ (5 \cdot 1) + (6 \cdot 5) & (5 \cdot 2) + (6 \cdot 6) & (5 \cdot 3) + (6 \cdot 7) & (5 \cdot 4) + (6 \cdot 8) \end{bmatrix}$$

$$\Rightarrow \begin{bmatrix} 11 & 14 & 17 & 20 \\ 23 & 30 & 37 & 44 \\ 35 & 46 & 57 & 68 \end{bmatrix}$$

← (ANS)

Ch 4-5 Determinants

Symbol: For matrix $\begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix} = A$

$\begin{vmatrix} 2 & 4 \\ 6 & 8 \end{vmatrix}$ means the determinant of A

The determinant of a matrix is a single number — it is a basic property of a matrix.

* The determinant is only defined for square matrices

$$\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

Memory AID $\Rightarrow$ use $\oplus$ AND $\ominus$ diagonal

EX $\begin{vmatrix} 2 & 4 \\ 6 & 8 \end{vmatrix} = +(2 \cdot 8) - (4 \cdot 6)$

$= 16 - 24 = \boxed{-8}$

The determinant of A 3×3

EX 3
Pg 194

$$\begin{vmatrix} -1 & 3 & -3 \\ 4 & -2 & -1 \\ 0 & -5 & 2 \end{vmatrix}$$

Repeat 1st 2 columns and draw 3 $\oplus$ and 3 $\ominus$ diagonals

OPEN 3 $\oplus$ and 3 $\ominus \Rightarrow$ PUT IN PRODUCTS

$$+(-1 \cdot -2 \cdot 2) + (3 \cdot -1 \cdot 0) + (-3 \cdot 4 \cdot 5) - (-3 \cdot 2 \cdot 0) - (-1 \cdot -1 \cdot 5) - (3 \cdot 4 \cdot 2)$$

$$+(4) + (0) + (60) - (0) - (-5) - (24)$$

$$69 - 24 = \boxed{45}$$

Homework: Ch. 4-2 } Ch. 4-3 } Ch. 4-5
Pg 164 } Pg 171 } Pg 172
#14, 15, 19 } #4-8 } #15-18, #27