2	- Invelses	
" 행정에서 연절	जिल्ला इंटरे?"	
# Ideatity	e. \(\alpha \times \mathre{C} = \mathre{C} \times \alpha = 0	α.
"함왱"	a*b = b*a =>	> €.
Propeuties.		
# 825	5 1. A+B = B+A.	(Cocumntative Jan).
	2. A+ (B+C) = (A+	B)+c (Associative low).
	3. A(BC) = (AB)	C (Associative law).
	4 A(Btc)=AB+	BC (Left distribution day).
	5. (B+C) A = BA +C	A (Right distribution law).
	5	
	6. A(B-C) = AB-	AC
	7. (B-CIA = BA-	cA.
	8. a (B+c)=aB+	aC.
	9. a (B-C)=aB-	-aC.
	10. (a+b) C=aC	+ bC.
	11. $(a-b)C=aC$	-bC.
	12. a (bC) = (ab)	C.
	13. a(BC) =(aB)	$C = {}^{\star}B(aC).$
*Ex.1)	Γ/27 Γ/27	C / 6 7
	$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} B = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$	C= 23
	(AB)C = A(BC) = 4	39
	L 4	

* ε (2) $AB = BA$ $A = \begin{bmatrix} -1 & 0 \\ 0 & 3 \end{bmatrix}, B = \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix}$ $AB = \begin{bmatrix} -1 & -2 \\ 11 & 4 \end{bmatrix}, BA = \begin{bmatrix} 3 & 9 \\ -3 & 0 \end{bmatrix} \Rightarrow AB \neq BA.$ **About and and solved. 2. AB and BA love different sizes. 3. AB \neq BA. **Ato = 0 \tau A = A appliable of the answer of the a	एडमन्य.	
$A = \begin{bmatrix} -1 & 0 \\ A & 3 \end{bmatrix}, B = \begin{bmatrix} 3 & 0 \\ -3 & 0 \end{bmatrix} \Rightarrow AB \neq BA.$ $AB = \begin{bmatrix} -1 & -2 \\ 11 & 4 \end{bmatrix}, BA = \begin{bmatrix} 3 & 0 \\ -3 & 0 \end{bmatrix} \Rightarrow AB \neq BA.$ $AB \Rightarrow AB \Rightarrow$		
$AB = \begin{bmatrix} -1 & -2 \\ 11 & 4 \end{bmatrix}, BA = \begin{bmatrix} 3 & 9 \\ -3 & 6 \end{bmatrix} \Rightarrow AB \neq BA.$ $\therefore BAM \text{ and } BA \text{ we differed.}$ $2. AB \text{ and } BA \text{ love differed.}$ $3. AB \neq BA.$ $\Rightarrow O \text{ (aBA 6).}$ $\Rightarrow O \text{ (aBA 6).}$ $\Rightarrow A + 0 = 0 + A = A. \text{ explain disselect.}$ $x \text{ Thun } / 4.2 \qquad \alpha. A + 0 = 0 + A = A.$ $Page 42, Boot. \qquad b. A - 0 = A.$ $C A - A = 0. (= A + (-A)).$ $d. OA = O.$ $e. \exists CA = 0, Jhen C = 0 \text{ or } A = O.$ $(\approx ab = 0 \text{ then } \alpha = 0 \text{ or } b = 0).$	* Ex 2)	7B= BA
$AB = \begin{bmatrix} 1 & -2 \\ 11 & 4 \end{bmatrix}, BA = \begin{bmatrix} 3 & 9 \\ -3 & 6 \end{bmatrix} \Rightarrow AB \neq BA.$ $\therefore BAM \text{ and } BA \text{ we different sizes.}$ $2. AB \text{ and } BA \text{ love different sizes.}$ $3. AB \neq BA.$ $\# Zero Matrices [0], \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ $\Rightarrow O \text{ (aBA 0).}$ $At0 = 0tA = A. \text{ explain disserted.}$ $X Thun / 4.2 \qquad \alpha. At0 = 0tA = A.$ $Page 42, Boot. \qquad b. A = 0.$ $C. A - A = 0. (= A + (-A)).$ $d. oA = O.$ $e. \exists cA = 0, Jhen C = 0 \text{ or } A = O.$ $(\approx ab = 0 \text{ then } \alpha = 0 \text{ or } b = 0).$		
# Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0] # Zero Matrices [0], [0		$A = \begin{bmatrix} -7 & 0 \\ 2 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 0 \\ 3 & 0 \end{bmatrix}$
# Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0] # Zero Matrices [0], [0		
# Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0 0] # Zero Matrices [0], [0 0] [0 0] # Zero Matrices [0], [0	£	$AB = \begin{bmatrix} -1 & -2 \\ \end{bmatrix}$ $AB = \begin{bmatrix} 3 & 9 \\ \end{bmatrix}$ $AB \neq BA$
\$ 7+4 4+11. \$ 1. AB: dofficed, BA: ned defined. 2. AB and BA have different sizes. 3. AB≠BA. # Zero Matrices [0], [0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	,	[11 4], Ot [-3 6] 7 HB7 BH.
\$ 1. AB: doffied, BA: ned defined. 2. AB and BA have different sizes. 3. AB \neq BA. # Zero Matrices. - [0], [0 0] [0 0 0] - 0 0 0 -	₹	出的可 叫出, Det 也是 公司 X.
2. AB and BA have different sizes. 3. AB \neq BA. # Zero Matrices. -[0], $\begin{bmatrix} 0 & 0 & 7 & \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 &$		र्भ नेथा.
# Zero Matrices. • [0], $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 &$	\$ 1.	AB: dofined, BA: not defined.
# Zero Matrices [0], [0 0] [0 0 0] → (dezto). A+0=0+A=A Spenial dest edd. * Thun /4.2 a. A+b=0+A=A. Page 42, Book. b. A-c=A. C. A-A=0. (= A+(-A)). d. oA = O. e. if cA=0, Jhen C=0 or A=O. (≈ ab=0 than a=0 or b=0).	2.	AB and BA have different sizes.
$\Rightarrow O (\text{dig2} + 0).$ $\Rightarrow A + 0 = 0 + A = A. \text{order}(A) \text{ dig2} = d \text{ dig2}.$ $\Rightarrow Thun /.4.2 \qquad \alpha. A + b = 0 + A = A.$ $Page 42, Book. \qquad b. A - 0 = A.$ $C A - A = 0. (= A + (-A)).$ $d. oA = O$ $e. \text{if } cA = 0, \text{ then } C = 0 \text{ or } A = O$ $(\approx ab = 0 \text{ then } a = 0 \text{ or } b = 0).$], 3.	AB≠BA.
$\Rightarrow O (\text{dig2} + 0).$ $\Rightarrow A + 0 = 0 + A = A. \text{order}(A) \text{ dig2} = 2 \text{ dig}.$ $\Rightarrow A + 0 = 0 + A = A.$ $\Rightarrow A + b$		
$\Rightarrow O (\text{dig2} + 0).$ $\Rightarrow A + 0 = 0 + A = A. \text{order} A \neq \text{dig}.$ $\Rightarrow Thun /.4.2 \qquad \alpha. A + b = 0 + A = A.$ $Parge = 42, Book. \qquad b. A - 0 = A.$ $= A - A = 0. (= A + (-A)).$ $= A - A = 0.$ $= A - $	# Zous Matica	107 [007 [000]
* Ato = Ot A = A Stabold is set set. * Thun 1.4.2 α . Ato = ot A = A. Page 42, Book. b. $A-o=A$. C $A-A=o$. (= $A+(-A)$). d. $oA=O$ e. if $cA=o$, then $c=o$ or $A=O$. ($\approx ab=o$ then $a=o$ or $b=o$).	4 200 MUNICE.	
* A+0=0+A=A Subally distributed as $A+0=0+A=A$. * Thun /4.2 \text{a.} \text{A+0} = 0+A=A. * Page 42, Book. \text{b.} \text{A-0} = A. * C A-A=0. (= A+(-A)). * d. \text{d.} = 0 * (\alpha \text{ab=0} \text{ then } C=0 \text{or } A=0. * (\alpha \text{ab=0} \text{ then } \text{ab=0} \).		
* A+0=0+A=A Subally distributed as $A+0=0+A=A$. **Page 42, Book. b. $A-0=A$. **C A-A=0. (= A+(-A)). **d. oA = O **e. if cA=0, then c=0 or A=O. (\$\approx\$ ab=0 then \$\approx\$ a=0.		⇒ O (ale2+0).
* Thun 1.4.2 α . At $b = 0 + A = A$. Page 42, Book. b . $A - 0 = A$. $C A - A = 0. (= A + (-A)).$ $d. oA = 0$ $e. if cA = 0, fhen c = 0 \text{ or } A = 0.$ $(\approx ab = 0 \text{ then } a = 0 \text{ or } b = 0).$		
Page 42, Book. b. $A-o=A$. $C A-A=o (=A+(-A)).$ $d. oA=O$ $e. if cA=o , fhen c=o or A=O$ $(\approx ab=o fhen a=o or b=o).$		· A+O=O+A=A SHOW 항鏡 역할.
Page 42, Book. b. $A-o=A$. $C A-A=o (=A+(-A)).$ $d. oA=O$ $e. if cA=o , fhen c=o or A=O$ $(\approx ab=o fhen a=o or b=o).$		
C $A-A=0$. $(=A+(-A))$. d. $oA=0$ e. $if cA=0$, then $c=0$ or $A=0$ ($\approx ab=0$ then $a=0$ or $b=0$).		
d. $oA = 0$ e. $iA = 0$, then $c = 0$ or $A = 0$ ($\approx ab = 0$ then $a = 0$ or $b = 0$)	rage (1), Da	
e. if $cA=0$, then $c=0$ or $A=0$. ($\approx ab=0$ then $a=0$ or $b=0$).		
$(\approx ab=0 \text{ then } a=0 \text{ or } b=0).$		
* $ab = cb : b \neq 0 \rightarrow \alpha = c$. b = 0.		
b=0.		$* ab = cb : b \neq 0 \rightarrow \alpha = c.$
		b = 0.

NO. 24, 03.26.

र्विष्ठेपर्ने	
* Ex 3)	Failure of the cancellation law.
Page 43,	
, d	
	· A = [0 1] B = [3 4] C = [257
	[0 2] / L/ + 1 / - L3 4]
	$AB = AC = \begin{bmatrix} 3 & 4 \\ 6 & 8 \end{bmatrix}, B \neq C.$
	hetween
	: Caucallation is failed when product cuatices.
x Ex 4).	$A = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$, $B = \begin{bmatrix} 3 \\ 0 \end{bmatrix}$. $AB = 0$, $A \neq 0$, $B \neq 0$.
	Log I, PLOO I. MB-D, ATD, DTD.
# Identity	advices. Square Matrix
	· [t o]
	L 0 0 / 1 . 40/2/110.
	· In => Size n Identity Matrices.
	$AI_{s} = \begin{bmatrix} a_{11} & a_{12} & a_{23} \\ a_{21} & a_{22} & a_{23} \end{bmatrix}$ $a_{11} = \begin{bmatrix} a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{bmatrix}$
	1 A a a a a a a a a a a a a a a a a a a
	Als = as as as I go of I.
	8 a 11 9 12 01 13.
	a ₂₁ a ₂₂ a ₂₃ .
* Thu 1.4.	3)
1.4.	7).
	R: RREF, Square Matrices. > Sleast one vow of zeros (all zero.
	R is identity Matrix.
	R is ideal the Matrix

130H	<u>+</u> .	NO.24.03.26.
	(305). (A) : b Augmented Martin. L) N×n.	
	→ # + + + + + + + + + + + + + + + + + +	
	dy d + 2√ → x2	= 0. 9 = b = c. = d. = e.
# Inco	e of a Matrix.	
	" $\alpha \cdot \alpha^{-1} = \alpha^{-1}$. $\alpha = 1$."	
	· SA, B is square matrix with same size.	
	AB=BA=I.	
	5.	
	· A(or B) is investable (topold).	
	Non-singular (H)=0/24). If is not investable, then singular	
* Ex E	5.). $A = \begin{bmatrix} 2 & -5 \\ -1 & 3 \end{bmatrix}, B = \begin{bmatrix} 3 & 5 \\ 2 & 2 \end{bmatrix}$ $A = \begin{bmatrix} A & B & C \\ C & C \end{bmatrix}$	inoutable.
	$AB = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$, $BA = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$.	
	let then.	
* Ex 6	Jet then. BA = B[C, Q, o] = [BC, BC, o] Flentity Matrix 24 14 814. Cod	1 - 0 - d 2

1.4.4.) B, C. inverses of A. * Than ⇒ B=C. (= inverse is always unique). AB=BA=I => B = A-1 * Than 1.4.5). $A = \begin{bmatrix} ab \end{bmatrix}$ { $ad-bc=0 \rightarrow nat$ invariable. $ad-bc\neq 0 \rightarrow A^{-1} = \begin{bmatrix} d & -b \\ ad-bc & -c & a \end{bmatrix}$ * det (A) = determinant of A. = ad-bc. 2 0 6. xex7). $A = \begin{bmatrix} 6 & 1 \\ 5 & 2 \end{bmatrix} \Rightarrow A^{-1} = \begin{bmatrix} 2 & -1 \\ 12 - 5 & -5 & 6 \end{bmatrix}$ = 1 [2 +] $\begin{cases} ax+by=a. \\ cx+dy=v. \end{cases} = \begin{cases} a & b \\ c & d \end{cases} = \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} u \\ v \end{bmatrix}$ "gota" XEX8). जर्ड । हमान $\frac{1}{2} \frac{1}{2} \frac{1}$ ad-bc = 0. $\begin{cases} x \\ y \end{cases} = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} u \\ v \end{bmatrix}$ $\begin{cases} x \\ y \end{cases} = \frac{1}{ad-m} \begin{bmatrix} d-b \\ z \end{bmatrix} \begin{bmatrix} u \\ z \end{bmatrix}$ > 12H 2d > 9 all = 40 lld. * SHY 824 } A1?? $\frac{ax+by=u}{cx+dy=u}$ $\frac{a}{c}=\frac{b}{d}+\frac{u}{v}$

GO 11 - 1.	NO. 24,03.26.
*	
*Than 1.4.6.	$(AB)^{-1}$
	$(AB)^{-1} = B^{-1}A^{-1} \neq A^{-1}B^{-1}$
	$(AB)' = B^{-1}A^{-1}$ $(AB)(AB)^{-1} = (AB)(B^{-1})(A^{-1})$
	$(AB)' = B^{-1}A^{-1}$
	(110) (110) = (110)
	$I = ABB^{-1}A^{-1}$
	$= AIA^{-1} = AA^{-1}$
71音和音·	AL I S
# Powers of a	Matrix.
0.	o.4 C
Or C	
	ex.5 A° = I A° = AAA
	$A^{-n} = (A^{-1})^n A^{-1}A^{-1} \dots A^{-1}$
	$A^{-n} = (A^{-1})^n = A^{-1}A^{-1} - A^{-1}$
	$A^r A^s = A^{r+s}.$ $(A^r)^s = A^{rs}.$
* Than 1.4.7.	If A is inventable and
	n is non-negative integer.
	· · · · · · · · · · · · · · · · · · ·
	$\begin{array}{c} A^{-1} & \text{Invadable.} \\ (A^{-1})^{-1} = A. \end{array}$
	b. $A^n = (A^n)^{-1} = A^{-n} = (A^{-1})^n$
	A" Investable.
	C. KA Investable any non-zero scalar
	(KA) -1 = K-1 A-1.
	CUEL

とは 本本	a 2 27	F 9 9' 4' 4' 4	NO. 24.83. 28.
# Matrix Palgranial.	"# Matri	x Palymountal & Ed + Sold"	수확성 참젉
$\begin{cases} p(x) = a, \\ p(A) = a. \end{cases}$. +a, x + a2x2	+ + an zu.	
P(A) = A2-2	A-5I.		
= [-1	2] ~ 2 [-1	2.] - 5 [/ 6].	
* Than 1.4.8.	Cal (AT)T	= A.	
	(b) (AtB)	T=AT+BT	
	(c) (A-C)		
	(d) (hA)	$= kA^{\top} \longleftrightarrow (kA^{-1})_{=}$	TICAT.
	(e) (AB)T	= B^TA^T \approx $(AB)^T = $	B-1A-1.
* Thm 1. 4.9.	(A ⁺)	$f' = (A^{-1})^T$	