Matrices Review Name_____

1. Super Foods Inc produces tomato sauce and tomato paste, canned in small, medium, large and giant sized tins.

The matrix below gives the size, in ounces, of each container.

	Ounces
Small	6
Medium	10
Large	14
Giant	28

The matrix below tabulates one day's production of tomato and tomato paste

	Cans of Sauce	Cans of Paste
Small	200	2500
Medium	3000	1500
Large	2500	1000
Giant	1000	500

The matrix below gives the percent of water in the cans

	Cans of Sauce	Cans of Paste
Percent Water	20%	5%

A. Set up the matrices needed to find the total amount of ounces in all of the cans of sauce and paste for one day's production and then find the amounts.

$$\begin{bmatrix} 200 & 3000 & 2500 & 1000 \\ 2500 & 1500 & 1000 & 500 \end{bmatrix} \begin{bmatrix} 6 \\ 10 \\ 14 \\ 28 \end{bmatrix} = \begin{bmatrix} 94,200 \\ 58,000 \end{bmatrix}$$

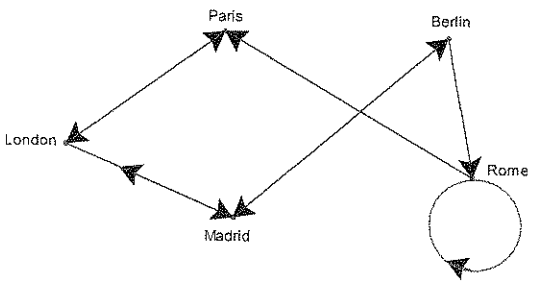
(Sm, Med, Lg, G) × (Oz) = (Cans of Sauce, Cans of Paste)

B. Set up the matrices needed to find the total amount of water in all of the cans for the day and find that amount.

$$\begin{bmatrix} 20\% & 5\% \end{bmatrix} \begin{bmatrix} 94,200 \\ 58,000 \end{bmatrix} = \begin{bmatrix} 21,340 \end{bmatrix}$$

(Cans of Sauce, Cans of Paste) × (Oz) = (Total Percent Water)

2. A. Set up a communication matrix for this network.



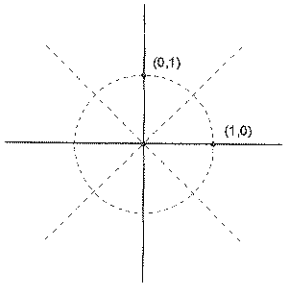
B. Find the matrix for 2 stops!

	B	L	M	P	R
B	0	0	1	0	1
L	0	0	1	1	0
M	1	1	0	0	0
P	0	1	0	0	0
R	0	0	0	1	1

matrix²

	B	L	M	P	R
B	1	1	0	1	1
L	1	2	0	0	0
M	0	0	2	1	1
P	0	0	1	1	0
R	0	1	0	1	1

3. WITHOUT USING YOUR NOTES FIND THE FOLLOWING TRANSFORMATION MATRICES:



A. reflection over y = x $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

B. Rotation 90° $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$

C. refection over y = 0 $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$

D. sizing of 8 $\begin{bmatrix} 8 & 0 \\ 0 & 8 \end{bmatrix}$

E. Rotation 180° $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$

F. refection over x= 0 $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$

4. WITHOUT USING YOUR NOTES, Identify these matrices

A. $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ $r_{y=-x}$

B. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ Identity

C. $\begin{bmatrix} -2 & 0 \\ 0 & -2 \end{bmatrix}$ S_{-2}

D. $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ $R_{-90°}$

5. Find the ending transformation for triangle ABC using matrices where A(-6, 3) B(5, -8) C (3, 9) Be sure to show the matrices used.

$(r_{y=-x} \circ R_{-90°})(\Delta ABC)$

$$\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix} \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix} \begin{matrix} A & B & C \\ \end{matrix} \begin{bmatrix} -6 & 5 & 3 \\ 3 & -8 & 9 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} -6 & 5 & 3 \\ 3 & -8 & 9 \end{bmatrix} \Rightarrow \begin{matrix} A' & B' & C' \\ \end{matrix} \begin{bmatrix} -6 & 5 & 3 \\ -3 & 8 & -9 \end{bmatrix}$$

6. Solve this system using matrices. Be sure to show the steps.

13A + 63C = 458 + 17B
20B – 19C + 532 = 42A
20C – 208 = -16A

$$\begin{matrix} A & B & C \\ \end{matrix} \begin{bmatrix} 13 & -17 & 63 \\ -42 & 20 & -19 \\ 16 & 0 & 20 \end{bmatrix} \begin{bmatrix} A \\ B \\ C \end{bmatrix} = \begin{bmatrix} 458 \\ -532 \\ 208 \end{bmatrix}$$

$$[A] \begin{bmatrix} A \\ B \\ C \end{bmatrix} = [B]$$

$$[A]^{-1}[A] \begin{bmatrix} A \\ B \\ C \end{bmatrix} = [A]^{-1}[B]$$

7. Find the identity of this set

☺	W	I	S	E
W	S	E	W	I
I	E	W	I	S
S	W	I	S	E
E	I	S	E	W

Identity = S

Show the steps to solve: E ☺ x = I

I ☺ E ☺ x = I ☺ I

S ☺ x = W

x = W

8. Define an identity $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} A \\ B \\ C \end{bmatrix} = \begin{bmatrix} 8 \\ -6 \\ 4 \end{bmatrix}$

9. Define an inverse