Station 1

Multiply the following Matrices.
you do <u>not</u> need to show work.

1. $\begin{bmatrix} 3 & 1 & -2 \\ 2 & -9 & 1 \\ 7 & 0 & 3 \end{bmatrix} \times \begin{bmatrix} -5 & 1 & -1 \\ 0 & 2 & -1 \\ 3 & 1 & 2 \end{bmatrix}$

2. $\begin{bmatrix} 3 & 1 \\ 6 & 2 \\ 0 & 1 \\ 1 & 9 \\ 2 & 4 \end{bmatrix} \times \begin{bmatrix} 6 \\ 7 \\ 0 \\ 1 \\ 2 \end{bmatrix}$

3. $\begin{bmatrix} 1 & 0 \\ -2 & -1 \\ 3 & 4 \\ 0 & -6 \end{bmatrix} \times \begin{bmatrix} -3 & 0 & 2 & 1 \\ 8 & 1 & -2 & 0 \end{bmatrix}$

4. $\begin{bmatrix} -3 & 0 & 2 & 1 \\ 8 & 1 & -2 & 0 \end{bmatrix} \times \begin{bmatrix} 1 & 0 \\ -2 & -1 \\ 3 & 4 \\ 0 & -6 \end{bmatrix}$

Station 2

5. Solve for x and y:

$$4\begin{bmatrix} 3 & x \\ 7 & 2 \end{bmatrix} + \begin{bmatrix} 7 & 9 \\ y & 0 \end{bmatrix} = \begin{bmatrix} 19 & 25 \\ 20 & 8 \end{bmatrix}$$

6. Find the inverse of the matrix

$$\begin{bmatrix} 4 & 8 \\ 7 & 3 \end{bmatrix}$$

7. What happens when you multiply a matrix by its inverse?

8. What do you get when you multiply a matrix by an identity matrix?

9. a) Solve this system

$$3x + 2y = 28$$

$$6x - 5y = 38$$

b) What method did you use?

Station 3

Find the determinant for each of the following:

10. $\begin{bmatrix} 2 & -3 \\ 7 & 6 \end{bmatrix}$

11. $\begin{bmatrix} 5 & 2 \\ 0 & 1 \end{bmatrix}$

12. $\begin{bmatrix} 4 & 2 & 3 \\ 5 & 1 & -1 \\ -2 & 0 & 6 \end{bmatrix}$

13. $\begin{bmatrix} 2 & 0 & -1 \\ 1 & 1 & -3 \\ 5 & -2 & 6 \end{bmatrix}$

Station 4

Use Cramer's rule to solve this system.

14.

$$x - y - z = -2$$
$$2x + 3y + z = 10$$
$$x - y - 4z = 4$$

a) Determinant of the coefficient matrix

b) Determinant of the x matrix

c) Determinant of the y matrix

d) Determinant of the z matrix

e $x =$

$y =$

$z =$

Station 5

15. Find the area of a triangle with vertices at $(2, 7)$, $(1, -2)$ and $(-2, 3)$

16. Find the area of a triangle with vertices at $(3, 7)$ $(3, -5)$ and $(2 -5)$

Station 6

Solve for x, y and z. (use any method)

17. $\begin{bmatrix} 2 & 3 \\ 5x & 7 \end{bmatrix} + \begin{bmatrix} y & 9 \\ x & 12 \end{bmatrix} = \begin{bmatrix} -11 & 12 \\ 18 & z \end{bmatrix}$

18. $\begin{bmatrix} 1 & 0 \\ 3 & 6 \end{bmatrix} + y\begin{bmatrix} 2 & 1 \\ x & 5 \end{bmatrix} = \begin{bmatrix} 9 & z \\ 15 & 26 \end{bmatrix}$

19. $2x + 5y = 4$

$-x + 3y = -13$

1. $\begin{bmatrix} -21 & 3 & -8 \\ -7 & -15 & 9 \\ -26 & 10 & -1 \end{bmatrix}$

2. Undefined

3. $\begin{bmatrix} -3 & 0 & 2 & 1 \\ -2 & -1 & -2 & -2 \\ 23 & 4 & -2 & 3 \\ -48 & -6 & 12 & 0 \end{bmatrix}$

4. $\begin{bmatrix} 3 & 2 \\ 0 & -9 \end{bmatrix}$

5. $4x+9=25$ $\quad$ $4 \cdot 7+y=2$

$x=4$ $\quad$ $y=-8$

6. $\begin{bmatrix} -3/44 & 2/11 \\ 7/44 & -1/11 \end{bmatrix}$

7 you get an identity matrix.

8 you get the same matrix

9 $x=8$

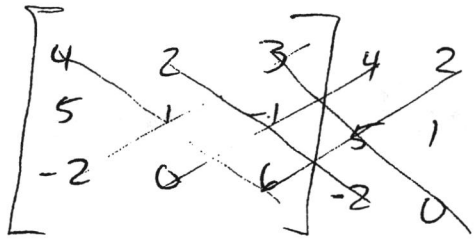
$y=2$

reduced row echelon form

inverse matrices, Cramer's rule

(10) $6 \cdot 2 - 7 \cdot (-3) = 12 - -21 = 33$

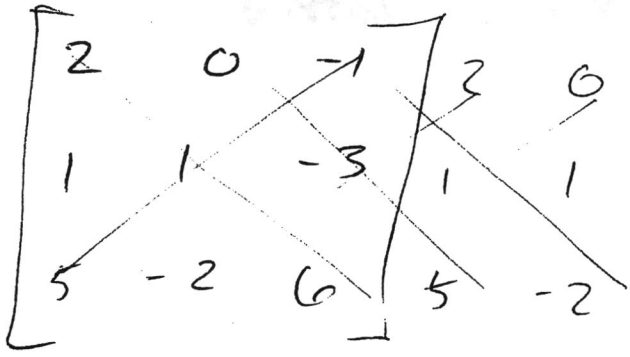
(11) $5 \cdot 1 - (0 \cdot 2) = 5 - 0 = 5$

(12) 

$\longrightarrow 24 + +4 + 0 - (-6 + 0\ 60)$

~~[illegible]~~

$28 - 54 = -26$

(13) 

$\longrightarrow 12 + 0 + 2 - (-5 + 12 + 0)$

$14 - 7$

7

14. $\det[\text{coefficient matrix}] =$

$\det[x\text{ matrix}] =$

$\det[y\text{-matrix}] =$

$\det[z\text{-matrix}] =$

$x = 0$

$y = 4$

$z = -2$

15 $\pm\frac{1}{2}\begin{vmatrix} 2 & 7 & 1 \\ 1 & -2 & 1 \\ -2 & 3 & 1 \end{vmatrix} = \pm\frac{1}{2}\cdot(-32) = 16$

16 $\pm\frac{1}{2}\begin{vmatrix} 3 & 7 & 1 \\ 3 & -5 & 1 \\ -2 & -5 & 1 \end{vmatrix} = \pm\frac{1}{2}(-60) = 30$

17. $2+y=-11$ $\quad$ $5x+x=18$ $\quad$ $7+12=z$

$y=-13$ $\quad$ $6x=18$ $\quad$ $19=z$

$x=3$

18 $\quad$ $1+y\cdot 2=9$ $\quad$ $3+y\cdot x=15$ $\quad$ $0+y\cdot 1=z$

$2y=8$ $\quad$ $3+4x=15$ $\quad$ $0+4\cdot 1=z$

$y=4$ $\quad$ $4x=12$ $\quad$ $4=z$

$x=3$

1 $\quad$ $x=3y+13$ → $2(3y+13)+5y=4$

$6y+26+5y=4$

$11y+26=4$

$11y=-22$

$y=-2$

$2x+5y=4$

$2x-10=4$

$2x=14$

$x=7$