

Chapter 4 Review

1. In May, Victor bought 36 styrofoam balls and decorated them as toy figurines. In June, he sold 16 figurines. In May, Martin bought 36 styrofoam balls to decorate and in June, he sold 13 figurines. Which matrix represents all of their May purchases and their June sales?

[A]

	May	June
Victor	36	36
Martin	16	13

[B]

	May	June
Victor	36	36
Martin	-20	-23

[C]

	May	June
Victor	36	20
Martin	36	23

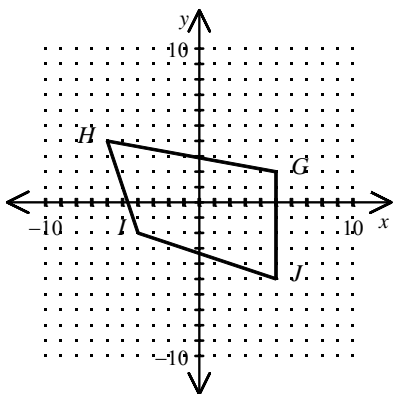
[D]

	May	June
Victor	36	-16
Martin	36	-13

[1] _____

2. Which matrix represents the graph of polygon *GHIJ*?

[2] _____



[A]

	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>
[A]	2	4	-4	5
	5	-6	-2	-5

[B]

	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>
[B]	5	-6	-4	5
	2	4	-2	-5

[C]

	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>
[C]	5	2	-4	-2
	-6	4	5	-5

[D]

	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>
[D]	5	-6	-4	-2
	2	4	5	-5

3. Let $A = \begin{bmatrix} 1 & -4 \\ -4 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 2 \\ 0 & -3 \end{bmatrix}$, and $C = \begin{bmatrix} 1 & 1 \\ 4 & -3 \end{bmatrix}$. Find $AC - CB$.

[A] $\begin{bmatrix} -18 & -27 \\ -8 & 14 \end{bmatrix}$

[B] $\begin{bmatrix} -27 & -8 \\ 14 & -18 \end{bmatrix}$

[C] $\begin{bmatrix} -17 & 13 \\ -8 & -26 \end{bmatrix}$

[D] $\begin{bmatrix} -18 & 14 \\ -8 & -27 \end{bmatrix}$

[3] _____

4. Find $\begin{bmatrix} 4 & 2 & 8 \end{bmatrix} \begin{bmatrix} 7 & 11 \\ 3 & 2 \\ 12 & 1 \end{bmatrix}$.

[A] $\begin{bmatrix} 28 & 44 \\ 6 & 4 \\ 96 & 8 \end{bmatrix}$

[B] $\begin{bmatrix} 40 \\ 26 \\ 104 \end{bmatrix}$

[C] $\begin{bmatrix} 130 & 56 \end{bmatrix}$

[D] $\begin{bmatrix} 40 & 26 & 104 \end{bmatrix}$

[4] _____

5. The Student Government secretary, and two teacher's aides are ordering supplies. The supplies they need are listed in the table.

	Notebooks	Pens	Paperclips
Secretary	12	7	8
Aide No. 1	7	12	3
Aide No. 2	8	2	3

If a spiral notebook costs \$2.25, a box of pens costs \$4.50, and a box of paperclips costs \$1.50, which of the following shows the use of matrices to find the total cost of supplies for each person?

[A] $\begin{bmatrix} \$2.25 & \$4.50 & \$1.50 \end{bmatrix} \begin{bmatrix} 12 & 7 & 8 \\ 7 & 12 & 3 \\ 8 & 2 & 3 \end{bmatrix} = \begin{bmatrix} \$72.00 & \$76.50 & \$19.50 \end{bmatrix}$

[B] $\begin{bmatrix} 12 & 7 & 8 \\ 7 & 12 & 3 \\ 8 & 2 & 3 \end{bmatrix} \begin{bmatrix} \$2.25 \\ \$4.50 \\ \$1.50 \end{bmatrix} = \begin{bmatrix} \$70.50 \\ \$74.25 \\ \$31.50 \end{bmatrix}$

[C] $\begin{bmatrix} 12 & 7 & 8 \\ 7 & 12 & 3 \\ 8 & 2 & 3 \end{bmatrix} \begin{bmatrix} \$2.25 & \$4.50 & \$1.50 \end{bmatrix} = \begin{bmatrix} \$168.00 \end{bmatrix}$ [D] $\begin{bmatrix} 12 & 7 & 8 \\ 7 & 12 & 3 \\ 8 & 2 & 3 \end{bmatrix} \begin{bmatrix} \$2.25 \\ \$4.50 \\ \$1.50 \end{bmatrix} = \begin{bmatrix} \$176.25 \end{bmatrix}$

[5] _____

6. Find the inverse of the following matrix (if it exists): $\begin{bmatrix} -1 & 3 \\ 2 & 4 \end{bmatrix}$

[A] $\begin{bmatrix} 4 & -3 \\ -2 & -1 \end{bmatrix}$

[B] $\begin{bmatrix} -\frac{2}{5} & \frac{3}{10} \\ \frac{1}{5} & \frac{1}{10} \end{bmatrix}$

[C] $\begin{bmatrix} -\frac{1}{10} & -\frac{1}{5} \\ \frac{3}{10} & \frac{2}{5} \end{bmatrix}$

[D] The matrix has no inverse.

[6] _____

7. Find the inverse of the following matrix (if it exists): $\begin{bmatrix} 0 & 1 & 4 \\ 1 & -1 & 0 \\ 0 & 2 & 9 \end{bmatrix}$

[A] $\begin{bmatrix} -9 & -9 & 2 \\ -1 & 0 & 0 \\ 4 & 4 & -1 \end{bmatrix}$

[B] $\begin{bmatrix} 9 & 1 & -4 \\ 9 & 0 & -4 \\ -2 & 0 & 1 \end{bmatrix}$

[C] $\begin{bmatrix} 1 & -4 & -4 \\ 0 & 0 & 1 \\ -2 & 9 & 9 \end{bmatrix}$

[D] The matrix has no inverse.

[7] _____

8. Find the determinant, and tell whether the matrix has an inverse.

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

[A] -74; Yes

[B] 0; No

[C] 26; Yes

[D] -13; Yes

[8] _____

Write the system of equations as a matrix equation. Then solve the system, if possible, by using a matrix equation. If not possible, classify the system.

$$9. \begin{cases} 3x + y = 5 \\ 2x - 5y = -8 \end{cases}$$

$$[A] \begin{bmatrix} 5 \\ -8 \end{bmatrix} \begin{bmatrix} x & y \end{bmatrix} = \begin{bmatrix} 3 & 2 \\ 1 & -5 \end{bmatrix}; \text{ dependent, infinitely many solutions}$$

$$[B] \begin{bmatrix} x & y \end{bmatrix} \begin{bmatrix} 3 & 2 \\ 1 & -5 \end{bmatrix} = \begin{bmatrix} 5 & -8 \end{bmatrix}; (1, 6)$$

$$[C] \begin{bmatrix} 3 & -1 \\ 2 & 5 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ -8 \end{bmatrix}; \text{ inconsistent, no solution} \quad [D] \begin{bmatrix} 3 & 1 \\ 2 & -5 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ -8 \end{bmatrix}; (1, 2)$$

[9] _____

$$10. \begin{cases} x + 2y - 3z = 7 \\ x + 2y + 3z = -5 \\ -x - 2y + 3z = -7 \end{cases}$$

[10] _____

$$[A] \begin{bmatrix} x & y & z \end{bmatrix} \begin{bmatrix} 1 & 2 & -3 \\ 1 & 2 & 3 \\ -1 & -2 & 3 \end{bmatrix} = \begin{bmatrix} 7 & -5 & -7 \end{bmatrix}; \text{ inverse} = 0; \text{ no solution.}$$

$$[B] \begin{bmatrix} 7 \\ -5 \\ -7 \end{bmatrix} \begin{bmatrix} x & y & z \end{bmatrix} = \begin{bmatrix} 1 & 2 & -3 \\ 1 & 2 & 3 \\ -1 & -2 & 3 \end{bmatrix}; (-2, 2, -2)$$

$$[C] \begin{bmatrix} x & y & z \end{bmatrix} \begin{bmatrix} 1 & -2 & -3 \\ -1 & 2 & -3 \\ -1 & 2 & 3 \end{bmatrix} = \begin{bmatrix} 7 & -5 & -7 \end{bmatrix}; (-3, -2, 4)$$

$$[D] \begin{bmatrix} 1 & 2 & -3 \\ 1 & 2 & 3 \\ -1 & -2 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 7 \\ -5 \\ -7 \end{bmatrix}; \text{ dependent, infinitely many solutions.}$$