Name _____ *Key*

1. The table shows several boxes of assorted candy available at a candy shop. What is the price per pound for each candy?

A) ($0.85, $0.75, $0.80)

B) ($0.75, $0.80, $0.85)

C) ($0.80, $0.75, $0.85)

D) ($0.75, $0.85, $0.80)

Box	Chocolate	Taffy	Nougat	Price ($)
Grand Edition	10	5	0	12.25
Special Edition	10	5	5	16.25
Deluxe Edition	15	10	5	24.25

x   y   z (handwritten over Chocolate, Taffy, Nougat)

$$\begin{bmatrix} 10 & 5 & 0 & 12.25 \\ 10 & 5 & 5 & 16.25 \\ 15 & 10 & 5 & 24.25 \end{bmatrix}$$

2. What is the determinant of $\begin{bmatrix} 3 & -2 \\ 4 & 0 \end{bmatrix}$? $0 - (-8)$ 1-/

A) –8   B) 8   C) 12   D) 20

3. What is the determinant of $\begin{bmatrix} 4 & 3 & 5 \\ 6 & 2 & 7 \\ 1 & 8 & 7 \end{bmatrix}$ $(+ +) - (+ +)$

A) 13   B) -43 *OK BY CALC*   C) 677   D) 9
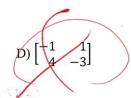
4. Find DE if $D = \begin{bmatrix} -2 & 4 & 6 \\ 5 & -7 & -1 \end{bmatrix}$ and $E = \begin{bmatrix} 1 & -2 \\ 0 & 4 \\ -3 & 4 \end{bmatrix}$.

A) $\begin{bmatrix} -20 & 44 \\ 8 & -42 \end{bmatrix}$

B) $\begin{bmatrix} -2 & -10 \\ 0 & -28 \\ -18 & -4 \end{bmatrix}$

C) $\begin{bmatrix} -20 & 8 \\ 44 & -42 \end{bmatrix}$

D) $\begin{bmatrix} -2 & 0 & 18 \\ -10 & 28 & 4 \end{bmatrix}$

5. Find the inverse of $\begin{bmatrix} 3 & -1 \\ -4 & 1 \end{bmatrix}$, if it exists. $3 - 4$ $\begin{bmatrix} 1 & 1 \\ 4 & 3 \end{bmatrix} = \begin{bmatrix} -1 & -1 \\ -4 & -3 \end{bmatrix}$

A) does not exist

B) $\begin{bmatrix} -1 & -1 \\ -4 & -3 \end{bmatrix}$

C) $\begin{bmatrix} 1 & 1 \\ 4 & 3 \end{bmatrix}$

D) $\begin{bmatrix} -1 & 1 \\ 4 & -3 \end{bmatrix}$

6. Solve the following system of equations using an inverse matrix.

$-4x - 2y + z = 6$
$-x - y - 2z = -3$
$2x + 3y - z = -4$

$\begin{bmatrix} -4 & -2 & 1 & 6 \\ -1 & -1 & -2 & -3 \\ 2 & 3 & -1 & -4 \end{bmatrix}$ OR $\begin{bmatrix} -4 & -2 & 1 \\ -1 & -1 & -2 \\ 2 & 3 & -1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 6 \\ -3 \\ -4 \end{bmatrix}$

A) (1, 0, –2)   B) (–1, 0, –2)   C) (–1, 0, 2)   D) (1, 0, 2)

$T \rightarrow 25p + 30c = 70$ 1, (1.5)
$N \rightarrow 20p + 22c = 53$

7. The cheerleading squad is raising money for new uniforms by selling popcorn balls and calendars. Tanya raised $70 by selling 25 popcorn balls and 30 calendars. Nichole raised $53 by selling 20 popcorn balls and 22 calendars. What is the cost of one calendar?

A) $1   B) $1.25   C) $1.50   D) $1.75

8. When does A^{-1} for a matrix A not exist?

$$\text{Det} = 0$$

9. Which are undefined? $A + B$, $B - A$, AB, or BA? For any that are undefined, give a reason.

$$A = \begin{bmatrix} 8 & 6 \\ 7 & -5 \end{bmatrix} \qquad B = \begin{bmatrix} -3 \\ 0 \end{bmatrix}$$

2×2 2×1 → OK

10. Find $2A - B$ if $A = \begin{bmatrix} -4x & 3 \\ 5z & -2 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 9y \\ 0 & -4 \end{bmatrix}$

$$\begin{bmatrix} -8x & 6 \\ 10z & -4 \end{bmatrix} + \begin{bmatrix} 1 & -9y \\ 0 & 4 \end{bmatrix} = \begin{bmatrix} -8x+1 & 6-9y \\ 10z & 0 \end{bmatrix}$$

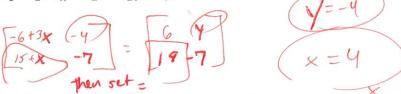11. Solve the system of equations using an inverse matrix.

$-3x + y + z = 2$
$5x + 2y - 4z = 21$
$x - 3y - 7z = -10$

$x = 1$

$y = 6$

$z = -1$

12. Last week, the owner of a diner spent $91.25 on 15 gallons of milk and 11 pounds of butter. This week, he spent $70.40 on 12 gallons of milk and 8 pounds of butter. Find the cost of one pound of butter.

Last week → $91.25 = 15m + 11b$

This week → $70.40 = 12m + 8b$ 3.25

mult 1st

13. Given that $\begin{bmatrix} -2 & 3 \\ 5 & 1 \end{bmatrix} \cdot \begin{bmatrix} 3 & -1 \\ x & -2 \end{bmatrix} = \begin{bmatrix} 6 & y \\ 19 & -7 \end{bmatrix}$. Solve for x and y.

$$\begin{bmatrix} -6+3x & -4 \\ 15+x & -7 \end{bmatrix} = \begin{bmatrix} 6 & y \\ 19 & -7 \end{bmatrix}$$

then set =

$y = -4$

$x = 4$

14. Billy's Restaurant ordered 200 flowers for Mother's Day. They ordered carnations at $1.50 each, roses at $5.75 each, and daisies at $2.60 each. They ordered mostly carnations, and 20 fewer roses than daisies. The total order came to $589.50. How many of each type of flower was ordered?

$x + y + z = 200$

$1.5x + 5.75y + 2.60z = 589.50$

$x - 20 = x$
$z \qquad\qquad y$

$80 = x$ [carnations]

$50 = y$ [roses]

$70 = z$ [daisies]