Lessons 3.5–3.8

MULTIPLE CHOICE

1. **TV COMMERCIALS** The cost (in thousands of dollars) of a 30 second commercial on two cable TV networks is shown below for two cities. The cost varies based on when the commercial airs: daytime (D), prime time (P), and late night (L).

Costs in City A

	D	P	L
Network 1	4.5	6	2.5
Network 2	5.5	8	2.5

Costs in City B

	D	P	L
Network 1	4	6.5	3.25
Network 2	5	8.5	3.25

Organize this information using two matrices A and B that give the costs for city A and city B, respectively. What is $B - A$? *TEKS a.5*

Ⓐ $\begin{bmatrix} 0.5 & -0.5 & -0.75 \\ 0.5 & -0.5 & -0.75 \end{bmatrix}$

Ⓑ $\begin{bmatrix} -0.5 & 0.5 & 0.75 \\ -0.5 & 0.5 & 0.75 \end{bmatrix}$

Ⓒ $\begin{bmatrix} -0.5 & -0.5 & 0.75 \\ -0.5 & -0.5 & 0.75 \end{bmatrix}$

Ⓓ $\begin{bmatrix} 9.5 & 12.5 & 5.75 \\ 10.5 & 16.5 & 5.75 \end{bmatrix}$

2. **COINS** A person has 85 coins, of which n are nickels, d are dimes, and q are quarters. The value of the coins is $13.25. There are twice as many quarters as dimes. The situation can be modeled using the matrix equation below. How many quarters does the person have? *TEKS 2A.3.B*

$$\begin{bmatrix} 1 & 1 & 1 \\ 0.05 & 0.1 & 0.25 \\ 0 & -2 & 1 \end{bmatrix} \begin{bmatrix} n \\ d \\ q \end{bmatrix} = \begin{bmatrix} 85 \\ 13.25 \\ 0 \end{bmatrix}$$

Ⓕ 20 **Ⓖ** 25 **Ⓗ** 40 **Ⓙ** 45

3. **SALES COMMISSION** A store has three departments: clothing (C), housewares (H), and electronics (E). Matrix A shows the total sales (in dollars) for two salespeople, Mary and Mark, in each department. Matrix B shows the commission on sales in each department. Which matrix shows the amount of commission for Mary and Mark? *TEKS a.5*

Matrix A

	Mary	Mark
C	175	270
H	370	225
E	200	255

Matrix B

C	H	E
3%	5%	8%

Ⓐ $\begin{bmatrix} 13.35 & 29.75 \end{bmatrix}$

Ⓑ $\begin{bmatrix} 38.50 & 40.50 \end{bmatrix}$

Ⓒ $\begin{bmatrix} 39.75 & 39.75 \end{bmatrix}$

Ⓓ $\begin{bmatrix} 397.50 & 397.50 \end{bmatrix}$

4. **ATOMIC WEIGHTS** The atomic weights of three compounds are shown in the table.

Compound	Formula	Atomic weight
Nitric acid	HNO_3	63
Nitrous oxide	N_2O	44
Water	H_2O	18

Let H, N, and O represent the atomic weights of hydrogen, nitrogen, and oxygen, respectively. What is the atomic weight of nitrogen? Use Cramer's rule. *TEKS 2A.3.B*

Ⓕ 1 **Ⓖ** 2 **Ⓗ** 14 **Ⓙ** 16

GRIDDED ANSWER ⓪①●③④⑤⑥⑦⑧⑨

5. **AGRICULTURE** A farmer harvests his crops and receives $2.35 per bushel of corn, $5.40 per bushel of soybeans, and $3.60 per bushel of wheat. The farmer harvests a total of 1700 bushels of crops and receives a total of $4837. The amount of corn harvested is 3.25 times the combined amount of soybeans and wheat harvested. How many bushels of wheat were harvested? *TEKS 2A.3.B*