

Chapter 4 Review

- 1 Percy has 14 coins in his pocket totaling \$2.60. The coins consist of only quarters and dimes. Which system could be solved to find the number of quarters, q , and dimes, d , in Percy's pocket?

A $\begin{cases} d + q = 2.6 \\ d + q = 14 \end{cases}$

B $\begin{cases} 25d + 10q = 2.6 \\ d + q = 14 \end{cases}$

C $\begin{cases} 0.25d + 0.10q = 2.6 \\ d + q = 10 \end{cases}$

D $\begin{cases} 0.25q + 0.10d = 2.6 \\ d + q = 14 \end{cases}$

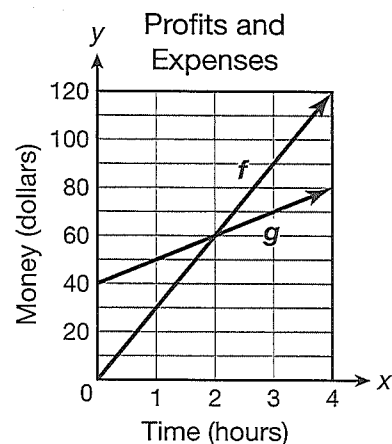
- 2 What is the x -value of the solution to the matrix below?

$$\begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 9 \end{bmatrix}$$

Record your answer and fill in the bubbles below.

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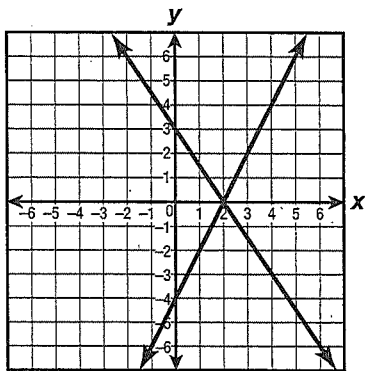
- 3 A baker sells muffins at a local farmers' market. He makes approximately \$30 per hour in profit. To rent his booth at the market, he pays a \$40 fee plus \$10 per hour. The graph below shows f , the function representing his profits, and g , the function representing his expenses.



What conclusion can be drawn from the graph?

- A The baker must sell 2 muffins for his profits to equal his expenses.
- B The baker must work for 2 hours for his profits to equal his expenses.
- C After 2 hours, the baker's expenses will be higher than his profits.
- D The baker's profits will never be higher than his expenses.

- 4 The graph below shows the functions $y = 2x - 4$ and $y = -\frac{3}{2}x + 3$.



Which is a solution to the following system of inequalities?

$$\begin{cases} y + 4 > 2x \\ 3x + 2y < 6 \end{cases}$$

- A $(-3, -1)$
- B $(4, 1)$
- C $(1, 5)$
- D $(2, -2)$

- 5 Jonah is going to the store to buy candles. Small candles cost \$3.50 and large candles cost \$5.00. He needs to buy at least 20 candles, and he cannot spend more than \$80. Which system of inequalities models this situation? Let S represent the number of small candles and L represent the number of large candles he will buy.

- A $\begin{cases} S + L \geq 80 \\ 3.5S + 5L \leq 20 \end{cases}$
- B $\begin{cases} S + L \leq 20 \\ 3.5S + 5L \geq 80 \end{cases}$
- C $\begin{cases} S + L \geq 20 \\ 3.5S + 5L \leq 80 \end{cases}$
- D $\begin{cases} S + L > 20 \\ 3.5S + 5L < 80 \end{cases}$

- 6 What is the solution to the following system of equations?

$$\begin{cases} 4x + 3y = -4 \\ 6x - y = 5 \end{cases}$$

- A $(-1, 0)$
- B $(0, -\frac{3}{4})$
- C $(\frac{1}{2}, -2)$
- D $(2, -4)$

- 7 At the same instant, a basketball was thrown and a soccer ball was kicked. The height of the basketball, in feet, can be modeled by the function $f(t) = -16t^2 + 12t + 8$, where t is the time in seconds after the ball was thrown. The height of the soccer ball, in feet, can be modeled by the function $g(t) = -16t^2 + 15.8t$, where t is the time in seconds after the ball was kicked, and $g(t)$ is the height of the ball, in feet, above the ground.

Soraya graphed both functions and found their point of intersection to be $(2.1, -37.7)$. What conclusion can Soraya draw?

- A The balls will reach the same height after 2.1 seconds.
- B The balls will reach the same height after 37.7 seconds.
- C The balls will both reach a maximum height of 37.7 feet.
- D The balls will only be at the same height when on the ground.

- 8 An ice cream stand sells chocolate, vanilla, and strawberry ice cream. Yesterday, they sold a total of 232 ice cream sundaes. They sold 4 fewer than 3 times as many vanilla ice cream sundaes as strawberry. The number of strawberry and vanilla ice cream sundaes combined was equal to the number of chocolate ice cream sundaes sold.

Which system of equations models this situation? Let v = the number of vanilla, s = the number of strawberry, and c = the number of chocolate ice creams sold.

A
$$\begin{cases} v + s + c = 232 \\ 3v - 4 = s \\ v - s = c \end{cases}$$

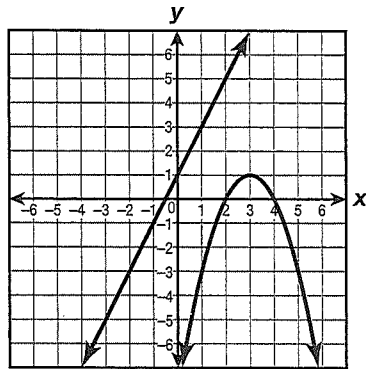
B
$$\begin{cases} v + s + c = 232 \\ 3s - 4 = v \\ v + s = c \end{cases}$$

C
$$\begin{cases} v + s + c = 4 \\ 3s - 4 = v \\ v + c = s \end{cases}$$

D
$$\begin{cases} v + s + c = 116 \\ 3s - 4 = c \\ v + c = s \end{cases}$$

- 9 The graph below shows the following system of equations.

$$\begin{cases} y = -x^2 + 6x - 8 \\ y = 2x + 1 \end{cases}$$



How many solutions does this system of equations have?

- A 0
 B 1
 C 2
 D Infinitely many
- 10 What is the determinant of the matrix shown below?

$$\begin{bmatrix} 2 & 1 \\ 3 & 7 \end{bmatrix}$$

Record your answer and fill in the bubbles below.

+	0	0	0	0	0	0	0	0
-	1	1	1	1	1	1	1	1
	2	2	2	2	2	2	2	2
	3	3	3	3	3	3	3	3
	4	4	4	4	4	4	4	4
	5	5	5	5	5	5	5	5
	6	6	6	6	6	6	6	6
	7	7	7	7	7	7	7	7
	8	8	8	8	8	8	8	8
	9	9	9	9	9	9	9	9

- 11 Soon Young is packing books into boxes. Each box can hold either 15 small books or 8 large books. He needs to pack at least 35 boxes and at least 350 books. Which system could be solved to find the number of small books, S , and the number of large books, L , Soon Young can pack?

- A $\begin{cases} S + L \geq 350 \\ \frac{S}{15} + \frac{L}{8} \geq 35 \end{cases}$
 B $\begin{cases} S + L \geq 35 \\ \frac{S}{15} + \frac{L}{8} \geq 350 \end{cases}$
 C $\begin{cases} S + L \leq 350 \\ \frac{S}{15} + \frac{L}{8} \leq 35 \end{cases}$
 D $\begin{cases} S + L \leq 35 \\ \frac{S}{15} + \frac{L}{8} \leq 350 \end{cases}$

12 The table below shows ordered pairs that satisfy the linear equations shown.

x	$y = -x + 3$	$y = 3x - 1$
-2	$y = -(-2) + 3 = 5$	$y = 3(-2) - 1 = -7$
-1	$y = -(-1) + 3 = 4$	$y = 3(-1) - 1 = -4$
0	$y = -(0) + 3 = 3$	$y = 3(0) - 1 = -1$
1	$y = -(1) + 3 = 2$	$y = 3(1) - 1 = 2$
2	$y = -(2) + 3 = 1$	$y = 3(2) - 1 = 5$
3	$y = -(3) + 3 = 0$	$y = 3(3) - 1 = 8$

What is the solution to the following system of equations?

$$\begin{cases} x + y = 3 \\ y = 3x - 1 \end{cases}$$

- A $(-1, 4)$
- B $(0, -1)$
- C $(1, 2)$
- D $(2, 1)$

- 13** The concession stand at a movie theatre sells popcorn in small, medium, and large containers. The prices are shown below.

Popcorn	
Small.....	\$4.75
Medium.....	\$6.50
Large.....	\$8.25

Yesterday, a total of 77 containers of popcorn were sold. Twice as many medium containers were sold as small containers. The concession stand collected a total of \$551.25 from popcorn sales.

- A.** Write a system of three equations in three variables to describe the situation. Be sure to define any variables used.
- B.** Solve the system using matrices and your graphing calculator. Write the matrix containing the solutions.
- C.** Interpret your results from part B.
