COMMON CORE ALGEBRA I: UNIT #5  Study Guide

PART I QUESTIONS: Show all of your work.

1. Which of the following is the \(x\)-coordinate of the solution to the system shown below?
   \[2x + 3y = 18\]
   \[4x - 3y = 12\]
   \(x = \underline{\text{___}}\)

2. The line \(y = \frac{1}{3}x - 2\) is graphed. Graph the other line \(y = -x + 6\) Which of the following would be the \(y\)-coordinate of the solution when both lines are graphed?

3. Which of the following equations would have a solution that is the same as the solution to the system?
   \[5x - 3y = -8\]
   \[4x + 7y = 38\]  \(\underline{\text{Solution}}\)
   \(x = 6\)
   \(y = \underline{\text{___}}\)
   \(\underline{\text{___}}\)
   \((x, y)\)

   \(\text{Circle: True or False}\)

4. Is \((4, 8)\) a solution to the system of equations?
   \[y = 5x - 12\]
   \[y = -3x + 20\]
5. The quadratic functions $f(x) = -x^2 + 8$ and $g(x) = \frac{1}{3}x - 2$ are shown. The positive solution to $f(x) = g(x)$ is which of the following.

Write a solution.

\[(-, -)\]

\(x\) value \(y\) value

6. Which of the following points is a solution to the system of inequalities shown graphed below?

Write a solution

\[y < \frac{1}{2}x - 2\]

\[y \geq -3x + 8\]

Is this point in the double shaded?

\[\text{ }(--,-)\]

7. Which of the following is the value of \(y\) that solves the system of equations shown below?

\[5x + 6y = 54\]

\[y = 2x\]

8. At what point do the lines $y = 3x - 5$ and $y = -2x + 3$ intersect? Show Mr. V the calculator.
PART II QUESTIONS: Show all of your work.

9. Find the value of $x$ that solves the system shown below. Show the work that leads to your answer.

\[
y = 3x \quad \text{and} \quad 2x + y = -30
\]

10. Graph the system of equations. \( y = -\frac{2}{3}x + 1 \) and \( y = \frac{1}{2}x - 6 \)

11. What is the solution to #10?

\[\text{intersection of the lines} \]

\[\text{Intersection} \quad (\text{coordinates}) \]

PART III QUESTIONS: Show all of your work.

12. Solve the following system of equations algebraically for the solution.

\[
\begin{align*}
5x + 2y &= 20 \\
-2y - x &= 4
\end{align*}
\]
13. Sketch the graph to the system of inequalities shown below. Explain how to shade.

\[ y > 4x - 8 \quad \text{and} \quad y \leq \frac{-2}{3}x + 6 \]

14. Graph the point \((5,1)\) Is it a solution to the system?

- **Circle Yes or No**

15. The Poughkeepsie Drama Club is selling tickets to an upcoming play. They can sell 500 tickets. The adult tickets sell for \(\$10\) each and student tickets cost \(\$5\). They would like to raise \(\$3,000\) if \(x\) represents the number of adult tickets and \(y\) represents the number of student tickets, answer the following. Write a system of equations that models this situation.

\[ \begin{align*}
\text{Number of adult tickets} + \text{Number of student tickets} &= \text{Total number of tickets} \\
\text{Cost of adult tickets} + \text{Cost of student tickets} &= \text{Total cost of tickets}
\end{align*} \]

16. A party is thrown where 20 tables are used. Each table either sits 8 people or 10 people. A total of 170 people can be sat at the tables. If \(E\) represents the number of 8 person tables and \(T\) represents the number of 10 person tables, write a system of equations that models this situation.

\[ \begin{align*}
\text{Number of eight-person tables} + \text{Number of ten-person tables} &= \text{Total number of tables} \\
\text{Total number of seats per eight-person table} + \text{Total number of seats per ten-person table} &= \text{Total seats in the room}
\end{align*} \]