### Algebra 1
Unit 2B Systems of Equations & Inequalities

<table>
<thead>
<tr>
<th>Solve the System using substitution.</th>
<th>Solve the system using elimination.</th>
<th>Solve the system by graphing.</th>
<th>Solve the system using any method.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. [4x + 3y = -8] [-2x + y = -6] ((1,-4))</td>
<td>2. [4x - 2y = 8] [y = -2] ((1,-2))</td>
<td>3. [5x - 4y = 2] [-5x + 3y = -9] ((6,7))</td>
<td>4. [-15x + 9y = 27] [-5x - y = 17] ((-3,-2))</td>
</tr>
<tr>
<td>5. [y = \frac{5}{7}x + 4] [y = -\frac{1}{7}x - 2] ((-7,-1))</td>
<td>6. [x = 7] [y = -x + 9] ((7,2))</td>
<td>7. [14x - 2y = 46] [y = 7x - 23] [\text{infinitely many solutions}]</td>
<td>8. [5x + y = 8] [-3x + 2y = -10] ((2,-2))</td>
</tr>
</tbody>
</table>
9. \[-7x - 8y = -23\]
\[4x + 4y = 12\]
\[
\begin{align*}
(1, 2)
\end{align*}
\]

10. \[-3x - 10y = -4\]
\[x - 5y = 18\]
\[
\begin{align*}
(3, -2)
\end{align*}
\]

11. Graph.
\[y \geq 3x - 6\]
\[y < 3x + 1\]

12. Graph.
\[x + 2y > 4\]
\[2x - y \geq 6\]

13. The school that Kayla goes to is selling tickets to the annual talent show. On the first day of ticket sales the school sold 6 senior citizen tickets and 7 student tickets for a total of $116. The school took in $26 on the second day by selling 4 senior citizen tickets and 1 student ticket. What is the price each of one senior citizen ticket and one student ticket?

\[
6x + 7y = 116
\]
\[4x + y = 26\]
\[
(3, 14)
\]

14. Natalie and Anjali each improved their yards by planting hostas and shrubs. They bought their supplies from the same store. Natalie spent $86 on 2 hostas and 7 shrubs. Anjali spent $104 on 8 hostas and 4 shrubs. Find the cost of one hosta and the cost of one shrub.

\[
2x + 7y = 86
\]
\[8x + 4y = 104\]
\[
(8, 10)
\]

15. The senior classes at High School A and High School B planned separate trips to New York City. The senior class at High School A rented and filled 12 vans and 11 buses with 737 students. High School B rented and filled 6 vans and 5 buses with 341 students. Each van and each bus carried the same number of students. Find the number of students in each van and in each bus.

\[
12x + 11y = 737
\]
\[6x + 5y = 341\]
\[
(11, 55)
\]

16. Jasmine and Brenda are selling cheesecakes for a school fundraiser. Customers can buy pecan cheesecakes and apple cheesecakes. Jasmine sold 2 pecan cheesecakes and 8 apple cheesecakes for a total of $146. Brenda sold 4 pecan cheesecakes and 7 apple cheesecakes for a total of $139. Find the cost each of one pecan cheesecake and one apple cheesecake.

\[
2x + 8y = 146
\]
\[4x + 7y = 139\]
\[
(5, 17)
\]
17. Sarah is selling bracelets and earrings. The bracelets cost $2 each and earrings cost $4 each. She needs to make at least $40.

a) Write an inequality to represent the income from jewelry sales.

\[ 2x + 4y \geq 40 \]

b) Graph the inequality.

\[ y = -\frac{1}{2} x + 10 \]

c) Give a solution to your inequality and explain what it means.

\((6,9)\)  
She can sell 6 bracelets and 9 necklaces to make at least $40.

18. A vendor sells cotton candy(x) and sodas at baseball games(y). He knows he must buy twice as much cotton candy as sodas. He can buy sodas for $0.50 per can and cotton candy $1.00 per package. The vendor plans to spend no more than $250 buying both items for the next game.

a) Write two inequalities representing the information above.

\[ 2x \geq y \quad \frac{1}{2} y + x \leq 250 \quad y \leq -2x + 500 \]

b) Using the graph to the right, Which region represents the solution to the system of inequalities? A, B, C, or D?

D