**AUGMENTED MATRIX METHOD TO SOLVE SYSTEM OF LINEAR EQUATIONS** (Precalculus, Section 9.7)

For the following exercises, write the augmented matrix for the linear system.

1. 8*x* − 37*y* = 8 2*x* +12*y* = 3
2. 2*x* − 3*y* = −9 5*x* + 4*y* = 58
3. 6*x* + 2*y* = −4 3*x* + 4*y* = −17
4. 2*x* + 3*y* = 12   4*x* + *y* = 14

For the following exercises, solve the system by Gaussian elimination.

1. $\left[ \left. \begin{matrix}1&0\\0&0\end{matrix} \right| \begin{matrix}3\\0\end{matrix} \right]$
2. $\left[ \left. \begin{matrix}1&2\\4&5\end{matrix} \right| \begin{matrix}3\\6\end{matrix} \right]$
3. $\left[ \left. \begin{matrix}-2&0\\ 0&2\end{matrix} \right| \begin{matrix}1\\1\end{matrix} \right]$
4. $\left[ \left. \begin{matrix}6&2\\3&4\end{matrix} \right| \begin{matrix}-4\\-17\end{matrix} \right]$
5. $\left[ \left. \begin{matrix}-4&-3\\3&-5\end{matrix} \right| \begin{matrix}-2\\-13\end{matrix} \right]$
6. $\left[ \left. \begin{matrix} 3& 4\\-6&-8\end{matrix} \right| \begin{matrix} 12\\-24\end{matrix} \right]$
7. $\left[ \left. \begin{matrix}11&10\\15&20\end{matrix} \right| \begin{matrix}43\\65\end{matrix} \right]$

For the following exercises, set up the augmented matrix that describes the situation, and solve for the desired solution.

1. Every day, a cupcake store sells 5,000 cupcakes in chocolate and vanilla flavors. If the chocolate flavor is 3 times as popular as the vanilla flavor, how many of each cupcake sell per day?
2. At a competing cupcake store, $4,520 worth of cupcakes are sold daily. The chocolate cupcakes cost $2.25 and the red velvet cupcakes cost $1.75. If the total number of cupcakes sold per day is 2,200, how many of each flavor are sold each day?
3. You invested $10,000 into two accounts: one that has simple 3% interest, the other with 2.5% interest. If your total interest payment after one year was $283.50, how much was in each account after the year passed?

**GRAPHING LINEAR INEQUALITIES IN TWO VARIABLES** (Basic Mathematics Review, Section 7.8)

For the *following* exercises, graph the inequalities and show (shade in) the solution region.

1. *y* ≤ *x* + 2



1. *y* < −12*x* + 3



1. 2*x* + 3*y* ≤ – 6



1. 2*x* + 5*y* ≥ 20



1. – 4*x* + 3*y* ≥ 12



1. 3*x* > – 12



1. 7*y* ≤ 21



1. *x* + 4*y* > 4



**GRAPHING SYSTEMS OF LINEAR INEQUALITIES IN TWO VARIABLES** (UMUC Course Module 1, Topic II)

For the *following* exercises, graph the system of inequalities. Show (**by shading in**) the feasible region.

1. *y* ≤ – *x* + 2 , *y*  ≥ – 5*x* + 2



1. 4*x* + *y* < 2 , *y*  > – 2



1. 3*x* + 2*y* ≥ 2 , *x* + 2*y* ≤ 2



1. 4*x* + 3*y* > – 9 , 2*x* – 3*y*  ≤ – 9



1. 5*x* + 2*y*  ≤ – 4 , *x* + 2*y*  < 4



1. *x*  ≥ 0 , *y*  ≥ 0



For the *following* exercises, graph the system of inequalities. Show (**by shading in**) the feasible region. Identify the ordered-pair “corner points” that define the feasible region.

1. 3*x* + 2*y* ≥ 10 , 2*x* + 3*y* ≥ 10 , *x* ≥ 0 , *y* ≥ 0



1. 4*x* + *y* ≤ 16 , *x* – 3*y*  ≤ – 9 , *x* ≥ 0 , *y* ≥ 0



1. 4*x* + *y* ≥ 8 , *x* + *y* ≤ 5 , *x* ≥ 0 , *y* ≥ 0



1. *y* ≤ 5 , *x* – *y*  ≤ 0 , *x* ≥ 0 , *y* ≥ 0



1. 2*x* + 5*y*  ≥ 20 , *x* ≤ 5 , *y* ≤ 5 , *x* ≥ 0 , *y* ≥ 0



1. *x* + *y* ≥ 4 , *x* + 2*y* ≥ 5 , *x*  ≥ 0 , *y*  ≥ 0

