Math 1314
Exam #4 Review  Chapters 5.1-5.3 and 5.7
In problems 1 & 2, solve each system of Linear Equations
1. \[
\begin{cases}
2x + 5y = -2 \\
3x - 4y = 20
\end{cases}
\]
2. \[
\begin{cases}
2x + 3y + 7z = 13 \\
3x + 2y - 5z = -22 \\
5x + 7y - 3z = -28
\end{cases}
\]
In problems 3-5, solve each system of linear equations using matrices and row reduction
3. \[
\begin{align*}
x + y + z &= 1 \\
2x + 2y &= 6 \\
3x + 4y - z &= -9
\end{align*}
\]
4. \[
\begin{align*}
x - y + z &= 8 \\
2x + 3y - z &= -2 \\
3x - 2y - 9z &= 9
\end{align*}
\]
5. \[
\begin{align*}
x - 3y + z &= 5 \\
2x - 4y + z &= 3 \\
3x - 7y + 2z &= 12
\end{align*}
\]
6. Evaluate the determinate and show work:
\[
\begin{vmatrix}
7 & 3 & 8 \\
9 & 2 & -4 \\
5 & 6 & 10
\end{vmatrix}
\]
7. Use Cramer’s Rule to solve the system
\[
\begin{align*}
5x - 4y &= 9 \\
x - 2y &= -3
\end{align*}
\]
8. Use Cramer’s Rule to determine just the y-coordinate of the solution to the linear system
\[
\begin{align*}
2x + y - 2z &= -1 \\
3x - 3y - z &= 5 \\
x - 2y + 3z &= 6
\end{align*}
\]
In problems 9 – 11, Let
\[
A = \begin{bmatrix}
6 & 10 & -2 \\
3 & -12 & -4 \\
-5 & 2 & 7
\end{bmatrix}, \quad B = \begin{bmatrix}
2 & -5 & 7 \\
8 & -9 & 3 \\
4 & 6 & -1
\end{bmatrix}, \quad C = \begin{bmatrix}
5 & 4 & 3 \\
-6 & 7 & -8 \\
-10 & 7 & 9
\end{bmatrix}, \quad D = \begin{bmatrix}
2 & 6 \\
7 & 9 \\
-10 & 11
\end{bmatrix}
\]
Find:
9. \( A - 2B \) 
10. \( AB \) 
11. \( CD \)
In problems 12-14, set-up the systems of linear equations that can be used to solve the following application problems and use a TI-83 to solve.
12. A travel agent offers two package vacation plans. The first plan costs $360 and includes 3 days at a hotel and a rental car for 2 days. The second plan costs $500 and includes 4 days at a hotel and a rental car for 3 days. Find the cost per day for the hotel and for the car.

13. A certain brand of razor blades comes in packages of 6, 12, and 24 blades, costing $2, $3, and $4 per pack, respectively. A store sold 12 packages containing a total of 162 razor blades and took in $35. How many packages of each type were sold?

14. The sum of three numbers is 16. The sum of twice the first number, 3 times the second number, and 4 times the third number is 46. The difference between 5 times the first number and the second number is 31. Find the three numbers.