## ECON 331

Tutorial Questions \#2
Problem 1 Find $A B=C$ If

$$
A=\left[\begin{array}{lll}
5 & 1 & 0 \\
2 & 1 & -1
\end{array}\right] \quad \text { and } \quad B=\left[\begin{array}{ll}
4 & 3 \\
1 & 1 \\
0 & 2
\end{array}\right]
$$

Problem 2 Find both $C=A B$ and $D=B A$ if

$$
A=\left[\begin{array}{ll}
1 & 2 \\
2 & 1
\end{array}\right] \quad \text { and } \quad B=\left[\begin{array}{ll}
1 & 0 \\
1 & 0
\end{array}\right]
$$

Problem 3 Find the determinant by LAPLACE Expansion of

$$
A=\left[\begin{array}{lll}
1 & 2 & 3 \\
0 & 1 & -1 \\
1 & 2 & 3
\end{array}\right]
$$

Problem 4 Find the inverse of $A$ using the formula $A^{-1}=\frac{1}{|A|} A d j A$ if

$$
A=\left[\begin{array}{ll}
1 & 1 \\
2 & 3
\end{array}\right]
$$

Problem 5 Find the inverse of $A$ using the formula $A^{-1}=\frac{1}{|A|} A d j A$ if

$$
A=\left[\begin{array}{ccc}
9 & 11 & 4 \\
3 & 2 & 7 \\
6 & 10 & 4
\end{array}\right]
$$

Problem 6 Solve the system $A x=d$ by matrix inversion, where

$$
\begin{aligned}
& 4 x+3 y=28 \\
& 2 x+5 y=42
\end{aligned}
$$

Problem 7 Solve for $x_{1}, x_{2}, x_{3}$ using Cramer's rule

$$
\begin{aligned}
& 4 x_{1}+x_{2}-5 x_{3}=8 \\
& -2 x_{1}+3 x_{2}+x_{3}=12 \\
& 3 x_{1}-x_{2}+4 x_{3}=5
\end{aligned}
$$

Problem 8 Consider the following macroeconomic model:

$$
\begin{array}{ll} 
& \text { goods market } \\
1 & Y=C+I_{0}+X_{0}-M \\
2 & C=C_{0}+b Y \\
4 & M=M_{0}+m Y
\end{array}
$$

The three endogenous variables are $Y, C$, and $M .\left(X\right.$ is exports, $M$ is imports). $I_{0}, X_{0}, C_{0}, M_{0}$ are Constants and $b$ and $m$ are coefficients (both are between 0 and 1)

1. Write this system as a $3 \times 3$ matrix system $A x=d$ where

$$
x=\left[\begin{array}{l}
Y \\
C \\
M
\end{array}\right]
$$

2. Show that the determinant is $|A|=1-b+m$
3. Use Cramer's Rule to Find $Y, C, M$
