(5pts) 1. Complete the indicated operation giving the result in both *"a+bi"* and *"$Re^{i\theta}$"* forms. Watch your units! and enter answer in the appropriate box.

Operation	*"a+bi"*	*"$Re^{i\theta}$"*
(2+4i)+(3+i)		
(2+i)(3+6i)		
$e^{i\pi} - 2$		
$\frac{5e^{i\pi}}{e^{i(\pi/2)}}$		

(5 pts) 2.Find the determinant of the matrix below. Enter result in the space provided.

Determinant of $\begin{bmatrix} 1 & 0 & 2 & 0 \\ 0 & 4 & 2 & 0 \\ 0 & 0 & 3 & 3 \\ 0 & 0 & 1 & 2 \end{bmatrix} = \begin{bmatrix} \quad \end{bmatrix}$

enter result above

(5 pts) 3.Find the inverse of the matrix below. Enter result in the space provided.

Inverse of $\begin{bmatrix} 1 & 2 & 0 \\ 3 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix} = \begin{bmatrix} \quad & \quad & \quad \\ \quad & \quad & \quad \\ \quad & \quad & \quad \end{bmatrix}$

(5pts) 4. Find the result of the indicated matrix operations below

$$\begin{bmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 2 & 1 \\ 1 & 1 \end{bmatrix} =$$

$$\begin{bmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix} =$$

(10pts) 5. Find the solution of the 2nd order differential equation below using Laplace Transforms.

$$3\ddot{x} + 15\dot{x} + 12x = 0, x(0) = 1, \dot{x}(0) = 2$$

Time Function e(t)	Laplace Transform E(s)
step, u(t)	$\frac{1}{s}$
ramp, t	$\frac{1}{s^2}$
exponential, e^{-at}	$\frac{1}{(s+a)}$
te^{-at}	$\frac{1}{(s+a)^2}$

Time Function e(t)	Laplace Transform E(s)
$\sin(bt)$	$\frac{b}{s^2+b^2}$
$\cos(bt)$	$\frac{s}{s^2+b^2}$
$e^{-at}\sin(bt)$	$\frac{b}{(s+a)^2+b^2}$
$e^{-at}\cos(bt)$	$\frac{s+a}{(s+a)^2+b^2}$