1) Using row operations only                                              (5,5 marks)
a) Find the inverse of

$$\begin{array}{ccc} 1 & 0 & 2 \\ 2 & 1 & 2 \\ 0 & 0 & 3 \end{array}$$

b) the determinant of:

$$\begin{array}{ccc} 3 & 0 & -1 \\ 2 & 4 & 5 \\ 4 & 4 & -7 \end{array}$$

2) By using co-factor, find                                               (5.7 marks)
A) the determinant of

$$\begin{array}{ccc} 2 & 2 & -1 \\ 1 & -1 & 2 \\ 3 & 3 & -1 \end{array}$$

B) the inverse of

$$\begin{array}{cccc} 0 & 3 & 1 & 7 \\ 0 & 3 & 4 & 6 \\ 2 & 5 & 9 & -7 \\ 0 & 0 & 2 & 5 \end{array}$$

3) a) simplify the equation

$$\frac{2 + i - i^{-7}}{i + i^2 + i^4}$$

b) Use DE Moivre's theorem to solve the equation: $4z^4 + 1 = 0$, leave your answers in normal form
c) Show that if w is a complex cube root of unity, then
$$1 + w + w^2 = 0.$$

(3,5,2 =10 marks)