$$\begin{matrix} x_1 & x_2 & 4x_3 & 4x_4 & 5 \\ x_1 & 2x_2 & 6x_3 & 6x_4 & 9 \\ 2x_1 & x_2 & 5x_3 & 4x_4 & 5 \end{matrix}$$

2. (4 marks) For which values of “*k*”

$$\begin{matrix} x & y & 3z & & 1 \\ 2x & y & 4z & & 3 \\ x & 2y & (k & 4)z & k \quad 3 \end{matrix}$$

$$X \qquad \begin{matrix} 1 & 3 \\ 1 & 4 \end{matrix} X \quad \begin{matrix} 1 & 1 \\ 0 & 1 \end{matrix} \quad \begin{matrix} 1 & 2 & 1 \\ 1 & 0 & 1 \end{matrix} \quad \begin{matrix} 0 & 1 \\ 1 & 0 \\ 1 & 1 \end{matrix}$$

$$A \quad \begin{matrix} 1 & 2 & 3 \\ 1 & 3 & 4 \\ 1 & 3 & 5 \end{matrix} \qquad X \quad \begin{matrix} x \\ y \\ z \end{matrix} \quad b \quad \begin{matrix} 2 \\ 1 \\ 2 \end{matrix}$$

$AX \quad b$ $\qquad A$

A $\qquad A^3 \quad 2A^2 \quad 3I \quad 0$

A

$$\begin{vmatrix} 1 & 1 & 2 & 1 \\ 1 & 2 & 2 & 2 \\ 2 & 1 & 1 & 2 \\ 2 & 4 & 1 & 5 \end{vmatrix}$$

7. (4 marks) Use Cramer's rule to solve the system for "*z*"

$$\begin{array}{l} 3x \quad y \quad 2z \quad 4 \\ 4x \quad y \quad 5z \quad 3 \\ 5x \quad y \quad 3z \quad 1 \end{array}$$

$$\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} \quad 5 \qquad \begin{vmatrix} & 3 & & 3 & & 3 \\ 2 & & 2 & & 2 & \\ & & & & & \end{vmatrix}$$

$3 \quad 3$ $\qquad \det(\quad) \quad 2, \det(\quad) \quad 3$

$\det \ (2 \quad)^{1}$ $\qquad \det \ \det(\quad)^{2} \quad 3^{2}$

$\det A \quad 4$

$\det C \qquad ^{2} \qquad ^{2}$

$\breve{u} \quad 1,2,0 \qquad \breve{v} \quad 2,0,1$

$\breve{u} \quad 1, \quad 1,0$

$\|\breve{a}\| \quad \breve{} \quad \breve{} \ \breve{} \ \breve{} \quad 2\breve{}$

$Proj_{c}(\breve{} \quad \breve{})$

$\breve{u} \qquad \breve{v}$

$\breve{u}\quad\breve{v}\quad\breve{w}\quad 6 \qquad\qquad \breve{v}\quad 2\breve{u}\quad\breve{w}$

$1, 3, 1$

$0, 1, \quad 1 \qquad\qquad 2x\quad y\quad z\quad 1$

$A\ 1, 3, 1\ ,\ B\ 0, 1, \quad 1\ ,\ C\ 1, 0, 2$

$B \qquad\qquad \overline{AC}$

$1, 3, 1$

$2x\quad 3y\quad z\quad 2$

$x\quad 1\quad t\ ,\ y\quad 2\quad t\ ,\ z\quad 1\quad t$

$3x\quad y\quad 3z\quad 1$

$P\quad 3x\quad y\quad 2z$

$x\quad y\quad z\quad 15$

$2x\quad y\quad 2z\quad 50$

$2x\quad y\quad z\quad 39$

$C\quad 15x\quad 50y\quad 39z$

$x\quad 2y\quad 2z\quad 3$

$x\quad y\quad z\quad 1$

$x\quad 2y\quad z\quad 2$