

$$\begin{array}{r} x_1 \quad x_2 \quad 4x_3 \quad 4x_4 \quad 5 \\ x_1 \quad 2x_2 \quad 6x_3 \quad 6x_4 \quad 9 \\ 2x_1 \quad x_2 \quad 5x_3 \quad 4x_4 \quad 5 \end{array}$$

2. (4 marks) For which values of "k"

$$\begin{array}{r} x \quad y \quad 3z \quad 1 \\ 2x \quad y \quad 4z \quad 3 \\ x \quad 2y \quad (k-4)z \quad k \quad 3 \end{array}$$

$$X \quad \begin{array}{ccc} 1 & 3 & X \\ 1 & 4 & \end{array} \quad \begin{array}{ccc} 1 & 1 & 1 \\ 0 & 1 & 1 \end{array} \quad \begin{array}{ccc} 2 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \end{array} \quad \begin{array}{c} 0 \\ 1 \\ 1 \end{array}$$

$$A \quad \begin{array}{ccc} 1 & 2 & 3 \\ 1 & 3 & 4 \\ 1 & 3 & 5 \end{array} \quad X \quad \begin{array}{c} x \\ y \\ z \end{array} \quad \begin{array}{c} 2 \\ b \\ 2 \end{array}$$

$$AX = b \quad A$$

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

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

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

$$3x - y + 2z = 4$$

$$4x - y + 5z = 3$$

$$5x - y + 3z = 1$$

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

$$\det \begin{pmatrix} 3 & 3 \\ 2 & 2 \end{pmatrix} = 0$$

$$\det \begin{pmatrix} 3 & 3 \\ 2 & 2 \end{pmatrix} = 0, \det \begin{pmatrix} 3 & 3 \\ 2 & 2 \end{pmatrix} = 0$$

$$\det \begin{pmatrix} 2 & 2 \\ 2 & 2 \end{pmatrix} = 0$$

$$\det \begin{pmatrix} 2 & 2 \\ 2 & 2 \end{pmatrix} = 0, \det \begin{pmatrix} 2 & 2 \\ 2 & 2 \end{pmatrix} = 0$$

$$\det A = 4$$

$$\det C = 2 \cdot 2 = 4$$

$$\vec{u}' = 1, 2, 0 \qquad \vec{v}' = 2, 0, 1$$

$$\vec{u}' = 1, 1, 0$$

$$\|\vec{a}'\| = \sqrt{1^2 + 1^2 + 0^2} = \sqrt{2}$$

$$\text{Proj}_{\vec{u}'}(\vec{v}')$$

$$\vec{u}' \cdot \vec{v}'$$

$$u' \quad v' \quad w' \quad 6 \quad v' \quad 2u' \quad w'$$

$$0, 1, 1$$

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

1, 3, 1

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

B

\overline{AC}

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

1, 3, 1

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

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

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

$$\begin{array}{r} x \quad y \quad z \quad 15 \\ 2x \quad y \quad 2z \quad 50 \\ 2x \quad y \quad z \quad 39 \end{array}$$

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

$$\begin{array}{r} x \quad 2y \quad 2z \quad 3 \\ x \quad y \quad z \quad 1 \\ x \quad 2y \quad z \quad 2 \end{array}$$

- - - -

-

-

- - -
- - -

-

-
-

=