

M146 Assignment V Due Thurs April 27, 2006

Points in the plane, Vectors in the plane, Adding vectors

Section 53 (page 601) 1, 26, 28, 36, 37

(1) $A = \begin{bmatrix} 1 & 3 \\ -1 & 5 \end{bmatrix}$ Find two solutions to $Av = \lambda v$ where v is a vector and λ is a scalar.

(2) $A = \begin{bmatrix} 0 & 0 & 1 & 2 & 3 \\ 1 & 2 & 0 & 1 & 2 \\ 1 & 2 & 1 & 3 & 5 \\ 1 & 2 & -1 & -1 & -1 \end{bmatrix}, \quad \vec{0} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}.$

What is the rank of A ? What is the nullity of A ? Give all solutions to $Ax = \vec{0}$.

(3) Plot the points $A = (2, 3)$ and $B = (5, -1)$. Find the lengths of OA and OB and AB .

(3b) $A = (2, 3)$ and $B = (5, -1)$. Let $v = \vec{AB}$, the vector from A to B . Plot v on the graph, with tail at the origin. Calculate a unit vector in the same direction as v . Give the equation for the line through A and B in parametric form.

(4) $A = (4, 1)$ and $B = (2, 4)$. Plot these points on the graph. Give the equation for the line through A and B in parametric form.

(5) Let $A = \begin{bmatrix} 1 & -3 \\ 2 & -6 \end{bmatrix}$ and $b = \begin{bmatrix} 2 \\ 4 \end{bmatrix}$.

Find all solutions of $Ax = 0$. Find all solutions of $Ax = b$. The solutions to $Ax = b$ can be described as the points on a line L . Give the equation for L in parametric form. Plot the line.

(6) Let $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 5 & -4 \end{bmatrix}$ and $b = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$.

Find all solutions of $Ax = 0$. Find all solutions of $Ax = b$. The solutions to $Ax = b$ can be described as the points on a line L . Give the equation for L in parametric form.

M146 Sample Quiz #05 for Thursday, April 27, 2006

(1) $A = \begin{bmatrix} 1 & 1 & -6 & 1 & -1 \\ 1 & -2 & 0 & -1 & -5 \\ 0 & 1 & -2 & 1 & 2 \\ 2 & 0 & -8 & 1 & 1 \end{bmatrix}$ $\vec{0} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$.

What is the rank of A ? What is the nullity of A ? Give all solutions to $Ax = \vec{0}$.

(3) Let $v = \vec{AB}$, the vector from A to B . Plot v on the graph. Calculate a unit vector in the same direction as v . Give the equation for the line through A and B in parametric form.

(3) Let $A = \begin{bmatrix} 1 & -2 \\ -3 & 6 \end{bmatrix}$, $b = \begin{bmatrix} 3 \\ -9 \end{bmatrix}$, $\vec{0} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$.

Find all solutions of $Ax = \vec{0}$. Find all solutions of $Ax = b$. The solutions to $Ax = b$ can be described as the points on a line L . Give the equation for L in parametric form. Plot the line.

(4) $A = \begin{bmatrix} 1 & 6 \\ -2 & 9 \end{bmatrix}$ Find two solutions to $Av = \lambda v$ where v is a vector and λ is a scalar.

(5) Let $A = \begin{bmatrix} 1 & 3 & -2 \\ 3 & 7 & -3 \end{bmatrix}$ and $b = \begin{bmatrix} 1 \\ 4 \end{bmatrix}$.

Find all solutions of $Ax = 0$. Find all solutions of $Ax = b$. The solutions to $Ax = b$ can be described as the points on a line L . Give the equation for L in parametric form.