SI Session: Sept. 8th, 10th & 12th, 2008
Mondays: 1:30 PM – 3:00 PM
Wednesdays: 4:50 PM – 6:20 PM
Fridays: 1:00 PM – 2:30 PM
Room 1239 SNAD

Prof. Stockton : Calculus III
Fall 2008
SI Leader : Neil Jody

[1] Let $\vec{u} = 2\hat{i} + \hat{j} - 2\vec{k}$ and $\vec{v} = -\hat{j} + 3\hat{k}$.

(a) Find the vector which has the same length as $\vec{u}$ and the opposite direction as $\vec{v}$.

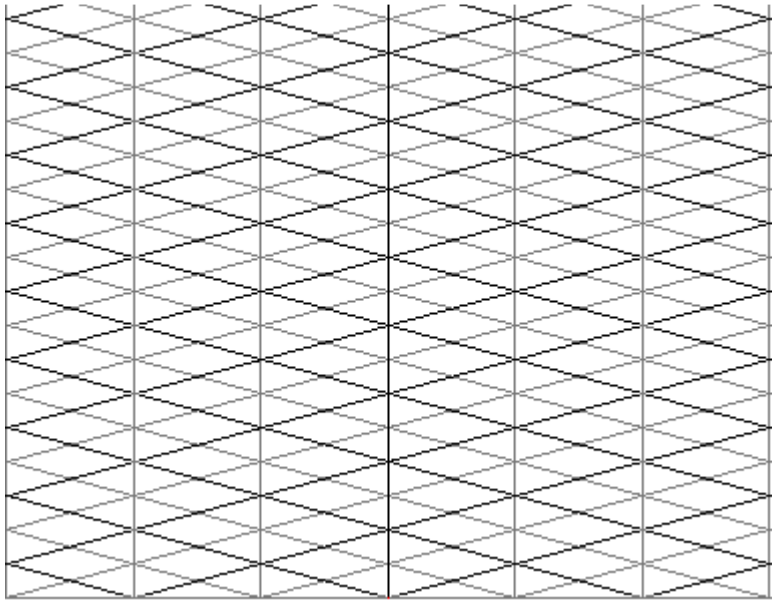
(b) Determine if the vector $\vec{w} = 6\hat{i} + \hat{j}$ lies in the plane of $\vec{u}$ and $\vec{v}$.

(c) Find all unit vectors which are orthogonal to both $\vec{u}$ and $\vec{v}$.

(d) Find the angle between $\vec{u}$ and $\vec{v}$.

[2] Find the vector that has length 3 and has the opposite direction as $\langle -1,2,4 \rangle$.

[3] Let $\vec{u} = \langle -1,4,-2 \rangle$. Find a vector $\vec{v}$ such that the area of the parallelogram spanned by $\vec{u}$ and $\vec{v}$ is 10.



[4] Find a set of parametric equations of the described line.

(a) The line that passes through the point $(-4,5,2)$ and is parallel to the *xy*-plane and the *yz*-plane.

(b) The line that passes through the point $(-4,5,2)$ and is perpendicular to the plane given by $-x+2y+z=5$.

(c) The line that passes through the point $(-1,4,-3)$ and is parallel to $\vec{v}=5\hat{i}-\hat{j}$.

(d) The line that passes through the point $(-6,0,8)$ and is parallel to the line $x=5-2t$, $y=2t-4$, $z=0$.

[5] Find an equation of the described plane.

(a) The plane that passes through $(2,3,-2)$, $(3,4,2)$, and $(1,-1,0)$.

(b) The plane that passes through the point $(1,2,3)$ and parallel to the *yz*-plane.

(c) The plane that passes through the points $(3,2,1)$ and $(3,1,-5)$ and is perpendicular to the plane $6x+7y+2z=10$.

(d) The plane that passes through the points $(4,2,1)$ and $(-3,5,7)$ and is parallel to the *z*-axis.

[6] Determine all values of c such that the angle between the vectors $\vec{u} = \langle -1,0,1 \rangle$ and $\vec{v} = \langle c,3,1 \rangle$ is 45°.

[7] Find parametric equations for the line through $(3,1,-2)$ that intersects and is perpendicular to the line given by: $x = -1 + t, y = -2 + t, z = -1 + t$.

[8] Find an equation of the plane that contains the following lines:

$l_1 : x = t, y = 2 - t, z = 2 + 3t$ and $l_2 : x = 1 + 4t, y = 1, z = 5 + 2t$

[9] Find the distance from the point (1,2,3) to the plane $x + y - 2z = 1$.