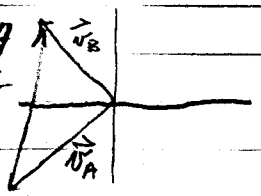
9.1.20 $|\vec{a}+\vec{b}| = |[-2,1,5]| = \sqrt{30}$; $|\vec{a}|+|\vec{b}| = \sqrt{5}+\sqrt{45}$

9.1.34 

$\vec{v}_A = [-500/\sqrt{2}, -500/\sqrt{2}]$; $\vec{v}_B = [-400/\sqrt{2}, 400/\sqrt{2}]$

$\vec{v} = \vec{v}_B - \vec{v}_A = [100/\sqrt{2}, 900/\sqrt{2}]$

9.2.14 $\vec{u}\cdot\vec{v} = \vec{u}\cdot\vec{w}$ iff $\vec{u}\cdot\vec{v} - \vec{u}\cdot\vec{w} = \vec{u}\cdot(\vec{v}-\vec{w}) = 0$ if $\vec{u} \perp (\vec{v}-\vec{w})$

Take $\vec{u} = [2,3]$; $\vec{v} = [-3,2]$; $\vec{w} = \vec{0}$. Then $\vec{u}\cdot\vec{v} = \vec{u}\cdot\vec{w} = 0$

9.3.10 $\vec{a}\times\vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 2 & 0 \\ 3 & -4 & 0 \end{vmatrix} = -10\vec{k}$; $(\vec{a}\times\vec{b})\times\vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 0 & -10 \\ 3 & 5 & 2 \end{vmatrix} = 50\vec{i} - 30\vec{j}$

$\vec{b}\times\vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 3 & -4 & 0 \\ 3 & 5 & 2 \end{vmatrix} = -8\vec{i} - 6\vec{j} + 27\vec{k}$; $\vec{a}\times(\vec{b}\times\vec{c}) = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 2 & 0 \\ -8 & -6 & 27 \end{vmatrix} = 54\vec{i} - 27\vec{j} + 10\vec{k}$

9.3.30 $\vec{w} = [\frac{5}{\sqrt{2}}, \frac{5}{\sqrt{2}}, 0]$; $\vec{r} = [4,2,-2]$; $\vec{v} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 5/\sqrt{2} & 5/\sqrt{2} & 0 \\ 4 & 2 & -2 \end{vmatrix} = [-10/\sqrt{2}, 10/\sqrt{2}, -10/\sqrt{2}]$

$|\vec{v}| = \sqrt{50+50+50} = \sqrt{150}$

9.3.32 $\vec{a} = [3,4,7]$; $\vec{b} = [4,12,11]$; $\vec{a}\times\vec{b} = \begin{bmatrix} \vec{i} & \vec{j} & \vec{k} \\ 3 & 4 & 7 \\ 4 & 12 & 11 \end{bmatrix} = [-40,-5,20]$

Area $= \sqrt{40^2+5^2+20^2} = 5\sqrt{64+1+16} = 45$

9.3.36 $\vec{a} = [2,3,2]$; $\vec{b} = [1,-5,3]$; $\vec{n} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 2 & 3 & 2 \\ 1 & -5 & 3 \end{vmatrix} = [19,-4,-13]$

$19x - 4y - 13z = c = 19 - 24 = -5$ so $19x - 4y - 13z = -5$