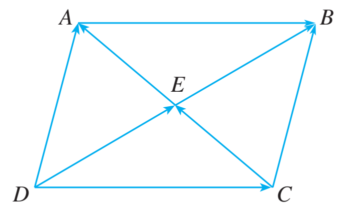
MA 213 Worksheet #2

Section 12.2

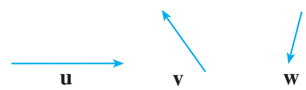
1 *12.2.3* Name all the equal vectors in the parallelogram shown.



2 *12.2.5* Copy the vectors in the figure and use them to draw the following vectors.

a $\mathbf{u}+\mathbf{v}$ **b** $\mathbf{u}+\mathbf{w}$

c $\mathbf{v}+\mathbf{u}+\mathbf{w}$ **d** $\mathbf{u}-\mathbf{v}-\mathbf{w}$



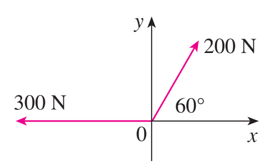
3 *12.2.13* For $A(0,3,1)$ and $B(2,3,-1)$, find a vector $\mathbf{a}$ with representation given by the directed line segment $\overrightarrow{AB}$. Draw $\overrightarrow{AB}$ and the equivalent representation starting at the origin.

4 *12.2.21* Find $\mathbf{a}+\mathbf{b}$, $4\mathbf{a}+2\mathbf{b}$, $|\mathbf{a}|$ and $|\mathbf{a}-\mathbf{b}|$ for $\mathbf{a}=4\mathbf{i}-3\mathbf{j}$ and $\mathbf{b}=2\mathbf{i}-4\mathbf{k}$.

5 *12.2.25* Find a unit vector that has the same direction as $8\mathbf{i}-\mathbf{j}+4\mathbf{k}$.

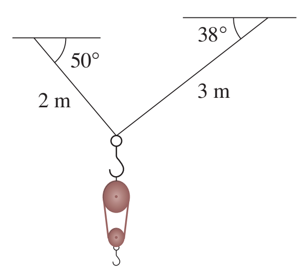
6 *12.2.29* If $\mathbf{v}$ lies in the first quadrant and makes an angle $\pi/3$ with the positive x-axis and $|\mathbf{v}|=4$, find $\mathbf{v}$ in component form.

7 *12.2.33* Find the magnitude of the resultant force and the angle it makes with the positive x-axis.



Additional Recommended Problems

8 *12.2.37* A block-and tackle pulley hoist is suspended in a warehouse by ropes of lengths 2 m and 3 m. The hoist weighs 350 N. The ropes, fastened at different heights, make angles of 50° and 38° with the horizontal. Find the tension in each rope and the magnitude of each tension.



9 *12.2.45* Let $\mathbf{a}=\langle 3,2\rangle$, $\mathbf{b}=\langle 2,-1\rangle$ and $\mathbf{c}=\langle 7,1\rangle$. Show, by means of sketch, that there are scalars s and t such that $\mathbf{c}=s\mathbf{a}+t\mathbf{b}$. Find the exact values of s and t.

10 *12.2.47* If $\mathbf{r}=\langle x,y,z\rangle$ and $\mathbf{r}_0=\langle x_0,y_0,z_0\rangle$, describe the set of all points (x,y,z) such that $|\mathbf{r}-\mathbf{r}_0|=1$.