Math 40, Section:
Homework #1

#2 Draw the vectors in Exercise 1 with their tails at the point (2, -3).

#5 For each of the following pairs of points, draw the vector $\overrightarrow{AB}$. Then compute and redraw $\overrightarrow{AB}$ as a vector in standard position.

(a) $A = (1, -1), B = (4, 2)$

(b) $A = (0, -2), B = (2, -1)$

(c) $A = (2, \frac{3}{2}), B = (\frac{1}{2}, 3)$

(d) $A = (\frac{1}{3}, \frac{1}{3}), B = (\frac{1}{6}, \frac{1}{2})$

#8 Refer to the vectors in Exercise 1. Compute the indicated vectors and also show how the results can be obtained geometrically.

$$\mathbf{b} - \mathbf{c}$$

#12 Refer to the vectors in Exercise 3. Compute the indicated vectors.

$$3\mathbf{b} - 2\mathbf{c} + \mathbf{d}$$

#14 In Figure 1.24, A, B, C, D, E, and F are the vertices of a regular hexagon centered at the origin. Express each of the following vectors in terms of
$\mathbf{a} = \overrightarrow{OA}$ and $\mathbf{b} = \overrightarrow{OB}$:

(a) $\overrightarrow{AB}$

(b) $\overrightarrow{BC}$

(c) $\overrightarrow{AD}$

(d) $\overrightarrow{CF}$

(e) $\overrightarrow{AC}$

(f) $\overrightarrow{BC} + \overrightarrow{DE} + \overrightarrow{FA}$

#16 Simplify the given vector expression.
Indicate which properties in Theorem 1.1 you use.

$$-3(\mathbf{a}-\mathbf{c})+2(\mathbf{a}+2\mathbf{b})+3(\mathbf{c}-\mathbf{b})$$

#17 Solve for the vector $\mathbf{x}$ in terms of the vectors $\mathbf{a}$ and $\mathbf{b}$.

$$\mathbf{x} - \mathbf{a} = 2(\mathbf{x} - 2\mathbf{a})$$

#22 Draw the standard coordinate axes on the same diagram as the axes relative to **u** and **v**. Use these to find **w** as a linear combination of **u** and **v**.
$\mathbf{u} = \begin{bmatrix} -2 \\ 3 \end{bmatrix}, \mathbf{v} = \begin{bmatrix} 2 \\ 1 \end{bmatrix}, \mathbf{w} = \begin{bmatrix} 2 \\ 9 \end{bmatrix}$