Due as follows:

Dr. Kondratieva	Tuesday September 21	in class or assignment box
Dr. Goodaire	Wednesday September 22	9:50 a.m.
Dr. Yuan	Wednesday September 22	in class

[1] 1. If
$$B = (1, 4)$$
 and $\overrightarrow{AB} = \begin{bmatrix} -1 \\ 2 \end{bmatrix}$, find A .

[2] 2. If possible, express
$$\mathbf{x} = \begin{bmatrix} 6 \\ -2 \\ 8 \end{bmatrix}$$
 as a scalar multiple of $\mathbf{u} = \begin{bmatrix} 4 \\ -\frac{4}{3} \\ \frac{16}{3} \end{bmatrix}$, of $\mathbf{v} = \begin{bmatrix} \frac{1}{2} \\ -\frac{1}{6} \\ \frac{4}{3} \end{bmatrix}$, of $\mathbf{v} = \begin{bmatrix} 1 \\ -\frac{1}{6} \\ \frac{4}{3} \end{bmatrix}$, of $\mathbf{w} = \begin{bmatrix} -3 \\ 1 \\ -4 \end{bmatrix}$, and of $\mathbf{y} = \begin{bmatrix} 15 \\ -5 \\ 20 \end{bmatrix}$. Justify your answers.

[3]

(a)
$$a \begin{bmatrix} -1 \\ 5 \end{bmatrix} - 3 \begin{bmatrix} -a \\ 2 \end{bmatrix}$$
 (b) $2 \begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix} + 5 \begin{bmatrix} -3 \\ 2 \\ -1 \end{bmatrix} + 3 \begin{bmatrix} 3 \\ -1 \\ 3 \end{bmatrix}$

[3] 4. Shown to the right are two nonparallel vectors u and v and four other vectors
$$w_1, w_2, w_3, w_4$$
. Reproduce u, v and w_2 in a picture by themselves and exhibit w_2 as the diagonal of a parallelogram with sides parallel to u and v. Guess values of *a* and *b* so that $w_2 = au + bv$.

is parallel to *BC* and one half its length.



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[1]	6. If possible, express	$\begin{bmatrix} 7\\7 \end{bmatrix}$ as a linear combination of	$\begin{bmatrix} -1\\1\end{bmatrix}$	and	5 2	•
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- [2] 7. Suppose u and v are vectors. Show that any linear combination of u and v is a linear combination of 2u and -3v.
- [2] 8. Show that if some nontrivial linear combination of vectors u and v is 0, then u and v are parallel.

[16]

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