1.5.1 Answers to Exercise.

1. (a) $\mathbf{v} = \begin{bmatrix} 20 \\ 6 \\ 11 \\ 8 \end{bmatrix}$.

    (b) $\alpha = 3$.

2. (a) $a = 2$.

    (b) $\mathbf{u}_1 + \mathbf{u}_2 = -\dfrac{1}{2}\mathbf{u}_2 + \dfrac{1}{2}\mathbf{u}_3 + \dfrac{1}{2}\mathbf{v}$.

3. *Comment.*
    The argument for these statements is formally the same as that for the analogous statements about column vectors.

4. (a) ——

    (b)   i. $a\mathbf{v} + b\mathbf{w} = (2a + b)\mathbf{u}_1 + (3a + b)\mathbf{u}_2 - 4a\mathbf{u}_3$.

          ii. $\mathbf{u}_1 = \mathbf{v} - 3\mathbf{w} + 4\mathbf{u}_3$.
              $\mathbf{u}_2 = \mathbf{v} - 2\mathbf{w} + 4\mathbf{u}_3$.

5. (a) $\mathbf{v} = 9\mathbf{x}_1 - 6\mathbf{x}_2 - 2\mathbf{y}_1 + \mathbf{y}_2$.

    (b) ——

6. ——

7. ——