

LaTeX document for LAFF class notes

### Homework 1.4.2: Linear Combinations of Vectors

#### Homework 1.4.2.1

$$3 \begin{bmatrix} 2 \\ 4 \\ -1 \\ 0 \end{bmatrix} + 2 \begin{bmatrix} 1 \\ 0 \\ 1 \\ 0 \end{bmatrix} = \begin{bmatrix} 8 \\ 12 \\ -1 \\ 0 \end{bmatrix}$$

#### Homework 1.4.2.2

$$(-3) \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} + 2 \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix} + 4 \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} = \begin{bmatrix} -3 \\ 2 \\ 4 \end{bmatrix}$$

#### Homework 1.4.2.3

Find  $\alpha$ ,  $\beta$ , and  $\gamma$  such that

$$\alpha \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} + \beta \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix} + \gamma \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} = \begin{bmatrix} 2 \\ -1 \\ 3 \end{bmatrix}$$

$$\alpha = 2$$

$$\beta = -1$$

$$\gamma = 3$$