1. For the vectors \( u = \begin{bmatrix} 2 \\ 1 \end{bmatrix} \), \( v = \begin{bmatrix} -4 \\ -2 \end{bmatrix} \), \( w = \begin{bmatrix} -1 \\ 3 \end{bmatrix} \) and \( G = \begin{bmatrix} 2 \\ 5 \end{bmatrix} \)

(a) is the vector \( v \) a linear combination of the vector \( u \) ?

(b) is the vector \( w \) a linear combination of the vectors \( u \) and \( v \) ?

(c) is the vector \( G \) a linear combination of the vectors \( u \) and \( v \) ?

(d) is the vector \( G \) a linear combination of the vectors \( u \) and \( w \) ?

(e) is the zero vector \( 0 \) a linear combination of the vector \( u \) ?

(f) is the vector \( u \) a linear combination of the zero vector \( 0 \) ?

(g) sketch all the linear combinations \( cu + dG \), where \( 0 \leq c \leq 1 \) and \( 0 \leq d \leq 1 \)

(h) sketch all the linear combinations \( cu + dv \), where \( 0 \leq c \leq 3 \) and \( 0 \leq d \leq 3 \)