$$\begin{aligned} v_1 &= (-4,3,5,-3) \\ v_2 &= (-4,-1,8,-14) \\ v_3 &= (-1,1,1,0) \\ v_4 &= (-1,-3,2,\mu-8) \\ v &= (1,1,\lambda,1) \end{aligned}$$

$$\begin{matrix} 1 \\ 1 \end{matrix}\left(\begin{array}{cccc|c} -4 & -4 & -1 & -1 & 1 \\ 3 & -1 & 1 & -3 & 1 \\ 5 & 8 & 1 & 2 & \lambda \\ -3 & -14 & 0 & \mu-8 & 1 \end{array}\right)$$

$$\rightarrow \begin{matrix} -4 \\ \\ 1 \\ -3 \end{matrix}\left(\begin{array}{cccc|c} -4 & -4 & -1 & -1 & 1 \\ -1 & -5 & 0 & -4 & 2 \\ 1 & 4 & 0 & 1 & \lambda+1 \\ -3 & -14 & 0 & \mu-8 & 1 \end{array}\right)$$

$$\rightarrow \begin{matrix} 16 \\ -5 \\ \\ 1 \end{matrix}\left(\begin{array}{cccc|c} 0 & 16 & -1 & 15 & -7 \\ -1 & -5 & 0 & -4 & 2 \\ 0 & -1 & 0 & -3 & \lambda+3 \\ 0 & 1 & 0 & \mu+4 & -5 \end{array}\right)$$

$$\rightarrow \left(\begin{array}{cccc|c} 0 & 0 & -1 & -33 & 16\lambda+41 \\ -1 & 0 & 0 & 11 & -5\lambda-13 \\ 0 & -1 & 0 & -3 & \lambda+3 \\ 0 & 0 & 0 & \mu+1 & \lambda-2 \end{array}\right)\begin{matrix} -1 \\ -1 \\ -1 \\ \\ \end{matrix}$$

$$\left|\begin{array}{rcrcl} x_3 & + & 33x_4 & = & -16\lambda-41 \\ x_1 & + & -11x_4 & = & 5\lambda+13 \\ x_2 & + & 3x_4 & = & -\lambda-3 \\ & & (\mu+1)x_4 & = & \lambda-2 \end{array}\right.$$

1 $\mu = -1$

1.1 $\lambda = 2$

$$\left|\begin{array}{rcrcl} x_3 & + & 33x_4 & = & -16\lambda-41 \\ x_1 & + & -11x_4 & = & 5\lambda+13 \\ x_2 & + & 3x_4 & = & -\lambda-3 \\ & & 0x_4 & = & 0 \end{array}\right.$$

$$\rightarrow \left|\begin{array}{rcrcl} x_3 & + & 33x_4 & = & -16\lambda-41 \\ x_1 & + & -11x_4 & = & 5\lambda+13 \\ x_2 & + & 3x_4 & = & -\lambda-3 \end{array}\right.$$

$x_4 = p$

$$\left|\begin{array}{lcrcc} x_3 & + & 33p & = & -16\lambda-41 \\ x_1 & + & -11p & = & 5\lambda+13 \\ x_2 & + & 3p & = & -\lambda-3 \end{array}\right.$$

$$\rightarrow \left|\begin{array}{lcc} x_3 & = & -16\lambda-41-33p \\ x_1 & = & 5\lambda+13+11p \\ x_2 & = & -\lambda-3-3p \end{array}\right.$$

1.2 $\lambda \neq 2$

$$\left|\begin{array}{lcrcc} x_3 & + & 33x_4 & = & -16\lambda-41 \\ x_1 & + & -11x_4 & = & 5\lambda+13 \\ x_2 & + & 3x_4 & = & -\lambda-3 \\ & & 0x_4 & = & \lambda-2 \end{array}\right.$$

2 $\mu \neq -1$

2.1 $\lambda = 2$

$$\left|\begin{array}{lcrcc} x_3 & + & 33x_4 & = & -16\lambda-41 \\ x_1 & + & -11x_4 & = & 5\lambda+13 \\ x_2 & + & 3x_4 & = & -\lambda-3 \\ & & (\mu+1)x_4 & = & 0 \end{array}\right.$$

$$\rightarrow \left|\begin{array}{lcc} x_3 & = & -16\lambda-41 \\ x_1 & = & 5\lambda+13 \\ x_2 & = & -\lambda-3 \\ x_4 & = & 0 \end{array}\right.$$

2.2 $\lambda \neq 2$

$$\left|\begin{array}{lcrcc} x_3 & + & 33x_4 & = & -16\lambda-41 \\ x_1 & + & -11x_4 & = & 5\lambda+13 \\ x_2 & + & 3x_4 & = & -\lambda-3 \\ & & (\mu+1)x_4 & = & \lambda-2 \end{array}\right.$$

$$\rightarrow \left|\begin{array}{lcc} x_3 & = & \frac{-(16\lambda+41)(\mu+1)-33(\lambda-2)}{\mu+1} \\ x_1 & = & \frac{(5\lambda+13)(\mu+1)+11(\lambda-2)}{\mu+1} \\ x_2 & = & \frac{-(\lambda+3)(\mu+1)-3(\lambda-2)}{\mu+1} \\ x_4 & = & \frac{\lambda-2}{\mu+1} \end{array}\right.$$

$$\rightarrow \left| \begin{array}{lcl} x_3 & = & \frac{-(16\lambda\mu+40\lambda+41\mu-25)}{\mu+1} \\ x_1 & = & \frac{5\lambda\mu+16\lambda+13\mu-9}{\mu+1} \\ x_2 & = & \frac{-(\lambda\mu+4\lambda+3\mu-3)}{\mu+1} \\ x_4 & = & \frac{\lambda-2}{\mu+1} \end{array} \right.$$