14
x -3

$14-\lambda$

$-3 \mid -42\ 3\lambda$

$-\lambda \mid -14\lambda\ \lambda^2$

15
x 30

$\lambda^2 - 11\lambda - 42$

$-\lambda \mid -\lambda^3\ 11\lambda^2\ 42\lambda$

$-11 \mid -11\lambda^2\ 121\lambda\ 462$

462
-450

-42
x 11

11
x 11

$-\lambda^3+121\lambda+42\lambda+462-(450+150\lambda)$

$-\lambda^3+163\lambda+12+150\lambda$ (+)

(-) $-\lambda^3+13\lambda+12=0$

~~$-11\lambda^2+313\lambda+12$~~

$-(\lambda+1)(\lambda+4)(\lambda-3)=0$

Our eigenvalues are $\lambda_s \{-1, -4, 3\}$

$\lambda=-1 : A+1I = \begin{bmatrix} -10 & -15 & 0 \\ 10 & 15 & 0 \\ -6 & -6 & -2 \end{bmatrix} \rightarrow \text{RREF} \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & -2/3 \\ 0 & 0 & 0 \end{bmatrix}$

$\vec{v}_1 + \vec{v}_3 = 0$

$\vec{v}_2 + -\frac{2}{3}\vec{v}_3$