Name _____ Linear Algebra, Quiz 7

Let A be a 9×9 matrix with 3 distinct eigenvalues.
$\lambda_1 = 5$ has only one linearly independent eigenvector $\vec{v}_1$.
$\lambda_2 = 12$ has two linearly independent eigenvectors $\vec{w}_1$ and $\vec{w}_2$.
$\lambda_3 = 27$ and no information about its eigenvectors is given.

1) What is the eigenspace corresponding to λ_1?

2) What are possible values for the multiplicity of λ_2?

3) How many linearly independent eigenvectors can there be for λ_3?

4) What are possible values for $|A|$?

5) What is the leading term in the characteristic polynomial of A? That is, when written in the standard order, what is the first term in $A - xI_9$?