1. In the following system of linear equations, regard $a$ as a constant. Use Gaussian elimination to solve the system, and answer the questions: For which values of $a$ does the system have no solutions? Exactly one solution? Infinitely many solutions?

\[ \begin{align*}
  x + 2y - 3z &= 4 \\
  3x - y + 5z &= 2 \\
  4x + y + (a^2 - 14)z &= a + 2
\end{align*} \]

No solutions for $a =$ \underline{\hspace{2cm}}

Exactly one solution for $a =$ \underline{\hspace{2cm}}

Infinite number of solutions for $a =$ \underline{\hspace{2cm}}