



Name: _____ () Class: _____ Date: _____

MA302.5.E2 (Adv) - Matrices Exercise

1. If $\begin{pmatrix} 3a & 2 \\ a & -a \end{pmatrix}$ is singular, find the possible values of a .
2. It is given that $3ax + 2y = 8$ and $ax - ay = k$, where a and k are real constants and $a \neq 0$.
 - (i) Determine the value of k if there are infinitely many solutions to the pair of simultaneous equations.
 - (ii) Use the matrix method to solve the simultaneous equations for x and y if $a = 1$ and $k = 6$.

3. Given that $\begin{pmatrix} 7 & -1 & -1 \\ -3 & m & 0 \\ -3 & 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 1 & 1 \\ 3 & 4 & 3 \\ 3 & 3 & 4 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$, show that $m = 1$. **Hence** solve the following simultaneous equations:

$$x + y + z = 1$$

$$3x + 4y + 3z = 2$$

$$3x + 3y + 4z + 3 = 0$$