

## 6F Part 1 Solving Equations with Matrices

$$\text{If: } A \begin{pmatrix} x \\ y \\ z \end{pmatrix} = v$$

$$\text{Then: } \begin{pmatrix} x \\ y \\ z \end{pmatrix} = A^{-1}v$$

1. Use an inverse matrix to solve the simultaneous equations:

$$-x + 6y - 2z = 21$$

$$6x - 2y - z = -16$$

$$-2x + 3y + 5z = 24$$

2. A colony of 1000 mole rats is made up of adult males, adult females, and youngsters. Originally there were 100 more adult females than adult males. After one year, the number of adult males had increased by 2%, the number of adult females had increased by 3%, the number of youngsters had decreased by 4%, and the total number of mole rats had decreased by 20. Find out how many of each type of mole rat were originally in the colony.