

8. It is given that  $\begin{pmatrix} x & 9 \\ 1 & 2 \end{pmatrix} \begin{pmatrix} -2 & y \\ 1 & -4 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ .
- Find the values of  $x$  and  $y$ .
  - Evaluate  $\begin{pmatrix} -2 & y \\ 1 & -4 \end{pmatrix} \begin{pmatrix} x & 9 \\ 1 & 2 \end{pmatrix}$ .
9. If  $\begin{pmatrix} 2x-3y & 9 & 8 \\ -1 & 23 & 7 \end{pmatrix} = \begin{pmatrix} 1 & 9 & 8 \\ -1 & 4x+y & 7 \end{pmatrix}$ , find the values of  $x$  and  $y$ .
10. If  $A = \begin{pmatrix} 1 \\ -2 \\ 5 \end{pmatrix}$  and  $B = (3 \ 0 \ 4)$ , evaluate the following where possible.
- $AB$
  - $BA$
  - $AB + BA$
11. Let  $A = \{x: x \text{ is an integer and } 3x + 4 < 11\}$ ,  
 $B = \{x: x \text{ is a root of } x^2 - 9 = 0\}$ ,  
 $C = \{x: x \text{ is an integer and } 9 - 2x < 5\}$ .
- List the elements in the sets  $A$ ,  $B$  and  $C$ .
  - Find  $A \cap B$  and  $A \cap C$ .
  - Find  $A \cup B$  and  $A \cup C$ .
12. It is given that set  $A = \{\text{letters from the word 'TOOTH'}\}$ .
- List the elements of  $A$ .
  - Find  $n(A)$ .
  - Write down all the subsets of  $A$ .
  - If set  $B = \{\text{letters from the word 'SOOTH'}\}$ , what is the relationship between the sets  $A$  and  $B$ ?
13. Let a universal set  $\varepsilon = \{x: x \text{ is a whole number}\}$ ,  $P = \{x: x \text{ is a prime number}\}$ ,  
 $C = \{x: x \text{ is a composite number}\}$  and  $F = \{x: x \text{ is a factor of } 24\}$ .
- List the elements of  $\varepsilon$  and  $F$ .
  - Is 51 an element of  $P$ ?
  - Is 1 an element of  $C$ ?
  - Find the following.
    - $C \cap P$
    - $C \cap F$
    - $P \cap F$
  - Is  $C \cup P = \varepsilon$ ?
  - Draw a Venn diagram to show the sets  $\varepsilon$ ,  $P$  and  $C$ .
14. Refer to the Venn diagram.
- Find  $A \cap B$ .
  - Copy the Venn diagram and shade the region that represents  $A' \cap B'$ .
  - If  $\varepsilon = \{a, b, c, d, e, f\}$ ,  $A = \{b, d\}$  and  $a \notin B$ , find
    - $A'$ ,
    - the largest possible set of  $B$ .

