

## SECTION 4.1

## NUMBER 11

4.1.11

Show  $\begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix} = - \begin{vmatrix} b_1 & b_2 \\ a_1 & a_2 \end{vmatrix}$ .

Solution

Well,  $\begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix} = (a_1)(b_2) - (a_2)(b_1)$   
 $= a_1 b_2 - a_2 b_1$ ,

and  $\begin{vmatrix} b_1 & b_2 \\ a_1 & a_2 \end{vmatrix} = (b_1)(a_2) - (b_2)(a_1)$   
 $= a_2 b_1 - a_1 b_2$ .

So

$$\begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix} = a_1 b_2 - a_2 b_1 = - (a_2 b_1 - a_1 b_2)$$
$$= - \begin{vmatrix} b_1 & b_2 \\ a_1 & a_2 \end{vmatrix}. \quad \square$$