

Section 2.2 selected answers

$$1.b \det A = \begin{vmatrix} 2 & -1 & 3 \\ 1 & 2 & 4 \\ 5 & -3 & 6 \end{vmatrix} \begin{array}{l} -2R_2 + R_1 \\ -5R_2 + R_3 \end{array} \begin{vmatrix} 0 & -5 & -5 \\ 1 & 2 & 4 \\ 0 & -13 & -14 \end{vmatrix}$$

$$= (-1)(-5) \begin{vmatrix} 1 & 2 & 4 \\ 0 & 1 & 1 \\ 0 & -13 & -14 \end{vmatrix} \begin{array}{l} (\text{interchange} \\ \text{rows 1 and 2}) \\ (\text{factor } -5 \\ \text{from row 2}) \end{array}$$

$$= (-1)(-5) \begin{vmatrix} 1 & 2 & 4 \\ 0 & 1 & 1 \\ 0 & 0 & -1 \end{vmatrix} \begin{array}{l} (\text{add} \\ 13 \text{ times row 2} \\ \text{to row 3.}) \end{array}$$

$$= (-1)(-5)(-1) = -5$$

$$\det A^T = \begin{vmatrix} 2 & 1 & 5 \\ -1 & 2 & -3 \\ 3 & 4 & 6 \end{vmatrix} = \begin{vmatrix} 0 & 5 & -1 \\ -1 & 2 & -3 \\ 0 & 10 & -3 \end{vmatrix} \begin{array}{l} 2R_2 + R_1 \\ 3R_2 + R_3 \end{array}$$

$$= (-1) \begin{vmatrix} -1 & 2 & -3 \\ 0 & 5 & -1 \\ 0 & 0 & -1 \end{vmatrix} \begin{array}{l} (\text{interchange} \\ \text{row 1 and 2}) \\ -2R_1 + R_3 \end{array}$$

$$= (-1)(-1)(5)(-1) = -5$$