

12. Given $\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} = -6$

a) $\begin{vmatrix} d & e & f \\ g & h & i \\ a & b & c \end{vmatrix} = (-1)(-6)$ b/c 2 rows are interchanged

c) $\begin{vmatrix} a+g & b+h & c+i \\ d & e & f \\ g & h & i \end{vmatrix} = -6$ since the determinant doesn't change when you add one row to another.

13. $\det A = \begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = \begin{vmatrix} 1 & 1 & 1 \\ 0 & b-a & c-a \\ 0 & b^2-a^2 & c^2-a^2 \end{vmatrix} \begin{matrix} -aR_1 + R_2 \\ -a^2R_1 + R_3 \end{matrix}$

$$b^2 - a^2 = (b-a)(b+a)$$

$$\begin{vmatrix} 1 & 1 & 1 \\ 0 & b-a & c-a \\ 0 & 0 & (c^2-a^2) - (c-a)(b+a) \end{vmatrix} \begin{matrix} \\ \\ -(b+a)R_2 + R_3 \end{matrix}$$

$$\begin{aligned} &= (b-a)((c^2-a^2) - (c-a)(b+a)) \\ &= (b-a)(c-a)[(c+a) - (b+a)] \\ &= (b-a)(c-a)(c-b) \end{aligned}$$