

If
$$\Delta = \begin{vmatrix} p & q & r \\ x & y & z \\ a & b & c \end{vmatrix}$$
 then:



Solution:

By property,

$$a C_{11} + b C_{12} + c C_{13} = 0$$

$$p M_{11} - q M_{12} + r M_{13} = \Delta$$

$$a_{11}C_{21} + a_{12}C_{22} + a_{13}C_{23} = 0$$

$$a_{11}C_{11} + a_{12}C_{12} + a_{13}C_{13} = \Delta$$

$$x M_{21} - y M_{22} + z M_{23} = \Delta$$



$$a C_{11} + b C_{12} + c C_{13} = 0$$



$$x C_{21} - y C_{22} + z C_{23} = \Delta$$



$$p M_{11} - q M_{12} + r M_{13} = \Delta$$