$L(\square) = \square C + C \square$

list

$L(A+B) = (A+B)C + C(A+B)$

$= AC + BC + CA + CB = ?$

$L(A) + L(B) = (AC + CA) + (BC + CB)$

$= AC + DC + CA + CB = ?$

$L(\alpha A) = (\alpha A)C + C(\alpha A) = \alpha AC + \alpha CA$

$\alpha L(A) = \alpha [AC + CA] = \alpha AC + \alpha CA$

(a)

list $L(\square) = \square C + C \square$

$= (\alpha A + \beta B)C + C(\alpha A + \beta B)$

$([\alpha \vec{a}_i] + [\beta \vec{b}_i]) c_j$

$[\alpha \vec{a}_i c_j + \beta \vec{b}_i c_j + \alpha \vec{c}_i a_j + \beta \vec{c}_i b_j]$

(ii) $\alpha L(A) + \beta L(B)$

$= \alpha [AC + CA] + \beta [BC + CB]$

$= \alpha AC + \alpha CA + \beta DC + \beta CB$

$[\alpha \vec{a}_i c_j + \alpha \vec{c}_i a_j + \beta \vec{b}_i c_j + \beta \vec{c}_i b_j]$