

$$\begin{aligned}
 5a) \quad & p(p-q) + q(q-r) + r(r-p) \\
 &= p^2 - pq + q^2 - qr + r^2 - rp \\
 &= p^2 + q^2 + r^2 - pq - qr - rp
 \end{aligned}$$

$$\begin{aligned}
 b) \quad & 2x(z-x-y) + 2y(z-y-x) \\
 &= 2xz - 2x^2 - 2xy + 2yz - 2y^2 - 2xy \\
 &= -2x^2 - 2y^2 + 2xz + 2yz - 4xy
 \end{aligned}$$

$$\begin{aligned}
 c) \quad & 4l(10n - 3m + 2l) - 3l(l - 4m + 5n) \\
 &= 40ln - \cancel{12lm} + 8l^2 - 3l^2 + \cancel{12lm} - 15ln \\
 &= 5l^2 + 25ln
 \end{aligned}$$

$$\begin{aligned}
 d) \quad & 4c(-a + b + c) - [3a(a + b + c) - 2b(a - b + c)] \\
 &= -4ac + 4bc + 4c^2 - [3a^2 + 3ab + 3ac - 2ab \\
 &\quad \quad \quad + 2b^2 - 2bc] \\
 &= -4ac + 4bc + 4c^2 - (3a^2 + 2b^2 + ab + 3ac - 2bc) \\
 &= -4ac + 4bc + 4c^2 - 3a^2 - 2b^2 - ab - 3ac + 2bc \\
 &= -3a^2 - 2b^2 + 4c^2 - ab + 6bc - 7ac
 \end{aligned}$$