



$$\begin{aligned}
 4\text{(iii)} \quad & x^4 - (y+z)^4 \\
 &= (x^2)^2 - [(y+z)^2]^2 \\
 &= [x^2 - (y+z)^2] [x^2 + (y+z)^2] \\
 &= [x - (y+z)] [x + (y+z)] [x^2 + y^2 + z^2 + 2yz] \\
 &= (x - y - z) (x + y + z) (x^2 + y^2 + z^2 + 2yz)
 \end{aligned}$$

$$\begin{aligned}
 4\text{(iv)} \quad & x^4 - (x-z)^4 \\
 &= (x^2)^2 - [(x-z)^2]^2 \\
 &= [x^2 - (x-z)^2] [x^2 + (x-z)^2] \\
 &= (\cancel{x^2} - \cancel{x^2} - z^2 + 2xz) (x^2 + x^2 + z^2 - 2xz) \\
 &= (-z^2 + 2xz) (2x^2 + z^2 - 2xz) \\
 &= z(2x - z) (2x^2 - 2xz + z^2)
 \end{aligned}$$

$$\begin{aligned}
 4\text{(v)} \quad & a^4 - 2a^2b^2 + b^4 \\
 &= (a^2)^2 - 2 \times a^2 \times b^2 + (b^2)^2 \\
 &= (a^2 - b^2)^2 \\
 &= (a^2 - b^2) (a^2 + b^2) \\
 &= (a - b) (a + b) (a^2 + b^2)
 \end{aligned}$$