

$$\begin{aligned}
 8(i) \quad & 8a^3 - b^3 - 12a^2b + 6ab^2 \\
 & = (2a)^3 - b^3 - 3 \times (2a)^2 \times b + 3 \times 2a \times b^2 \\
 & = (2a - b)^3 \\
 & = (2a - b)(2a - b)(2a - b)
 \end{aligned}$$

$$\begin{aligned}
 8(ii) \quad & 27 - 125a^3 - 135a + 225a^2 \\
 & = 3^3 - (5a)^3 - 3 \times 3^2 \times 5a + 3 \times 3 \times (5a)^2 \\
 & = (3 - 5a)^3 \\
 & = (3 - 5a)(3 - 5a)(3 - 5a)
 \end{aligned}$$

$$\begin{aligned}
 8(iii) \quad & 64a^3 - 27b^3 - 144a^2b + 108ab^2 \\
 & = (4a)^3 - (3b)^3 - 3 \times (4a)^2 \times 3b + 3 \times 4a \times (3b)^2 \\
 & = (4a - 3b)^3 \\
 & = (4a - 3b)(4a - 3b)(4a - 3b)
 \end{aligned}$$

$$\begin{aligned}
 8(iv) \quad & 27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p \\
 & = (3p)^3 - \left(\frac{1}{6}\right)^3 - 3 \times (3p)^2 \times \frac{1}{6} + 3 \times 3p \times \left(\frac{1}{6}\right)^2 \\
 & = \left(3p - \frac{1}{6}\right)^3 \\
 & = \left(3p - \frac{1}{6}\right)\left(3p - \frac{1}{6}\right)\left(3p - \frac{1}{6}\right)
 \end{aligned}$$

$$\begin{aligned}
 9.i \quad & \text{LHS} = x^3 + y^3 \\
 & \text{RHS} = (x + y)(x^2 - xy + y^2) \\
 & \quad = x^3 - x^2y + xy^2 + x^2y - xy^2 + y^3 \\
 & \quad = x^3 + y^3 \\
 & \therefore \text{LHS} = \text{RHS}
 \end{aligned}$$

$$\begin{aligned}
 9(ii) \quad & \text{RHS} = (x - y)(x^2 + xy + y^2) \\
 & \quad = x^3 + x^2y + xy^2 - x^2y - xy^2 - y^3 \\
 & \quad = x^3 - y^3 \\
 & \quad = \text{LHS}
 \end{aligned}$$