

$$\begin{aligned}
 v) \quad 4(x+y)^2 - 9(x-y)^2 &= 2^2(x+y)^2 - 3^2(x-y)^2 = \\
 &= (2(x+y))^2 - (3(x-y))^2 = (2x+2y)^2 - (3x-3y)^2 = \\
 &= [(2x+2y) - (3x-3y)] \cdot [(2x+2y) + (3x-3y)] \\
 &= (2x+2y-3x+3y) \cdot (2x+2y+3x-3y) \\
 &= (-x+5y) \cdot (5x-y)
 \end{aligned}$$

$$\begin{aligned}
 5) \quad i) \quad 25\alpha^2 + 20\alpha + 4 &= 5^2\alpha^2 + 20\alpha + 2^2 = (5\alpha)^2 + 2 \cdot (5\alpha) \cdot 2 + 2^2 = \\
 &= (5\alpha + 2)^2
 \end{aligned}$$

$$\begin{aligned}
 ii) \quad 4\alpha^2 - 28\alpha\beta + 49\beta^2 &= 2^2\alpha^2 - 28\alpha\beta + 7^2\beta^2 = (2\alpha)^2 - 2 \cdot (2\alpha) \cdot (7\beta) + (7\beta)^2 = \\
 &= (2\alpha - 7\beta)^2
 \end{aligned}$$

$$\begin{aligned}
 iii) \quad x^2 + \frac{2}{3}x + \frac{1}{9} &= x^2 + \frac{2}{3}x + \left(\frac{1}{3}\right)^2 = x^2 + 2 \cdot x \cdot \frac{1}{3} + \left(\frac{1}{3}\right)^2 = \\
 &= \left(x + \frac{1}{3}\right)^2
 \end{aligned}$$

$$\begin{aligned}
 iv) \quad x^3 + 6x^2y + 12xy^2 + 8y^3 &= x^3 + 3x^2 \cdot (2y) + 3x \cdot (2y)^2 + (2y)^3 \\
 &= (x + 2y)^3
 \end{aligned}$$

$$\begin{aligned}
 6) \quad i) \quad (x+1)^2 + x^2 - 1 &= (x+1)^2 + x^2 - 1^2 = \underbrace{(x+1)^2}_w + (x-1) \cdot \underbrace{(x+1)}_w = \\
 &= w^2 + (x-1)w = w(w + (x-1)) = (x+1)((x+1) + (x-1)) = \\
 &= (x+1)(x+1+x-1) = (x+1)2x
 \end{aligned}$$