v) $4(x+y)^2 - 9(x-y)^2 = 2^2(x+y)^2 - 3^2\cdot(x-y)^2 =$

$= \big(2(x+y)\big)^2 - \big(3(x-y)\big)^2 = (2x+2y)^2 - (3x-3y)^2 =$

$= \big[(2x+2y)-(3x-3y)\big]\cdot\big[(2x+2y)+(3x-3y)\big]$

$= (2x+2y-3x+3y)\cdot(2x+2y+3x-3y)$

$= (-x+5y)\cdot(5x-y)$

5) i) $25\alpha^2+20\alpha+4 = 5^2\alpha^2+20\alpha+2^2 = (5\alpha)^2+2\cdot(5\alpha)\cdot 2+2^2 =$

$= (5\alpha+2)^2$

ii) $4\alpha^2-28\alpha\beta+49\beta^2 = 2^2\cdot\alpha^2-28\alpha\beta+7^2\beta^2 = (2\alpha)^2-2\cdot(2\alpha)(7\beta)+(7\beta)^2$

$= (2\alpha-7\beta)^2$

iii) $x^2+\frac{2}{3}x+\frac{1}{9} = x^2+\frac{2}{3}x+\left(\frac{1}{3}\right)^2 = x^2+2\cdot x\cdot\frac{1}{3}+\left(\frac{1}{3}\right)^2 =$

$= \left(x+\frac{1}{3}\right)^2$

iv) $x^3+6x^2y+12xy^2+8y^3 = x^3+3x^2(2y)+3x(2y)^2+(2y)^3$

$= (x+2y)^3$

6) i) $(x+1)^2+x^2-1 = (x+1)^2+x^2-1^2 = \underbrace{(x+1)}_{\omega}^2+(x-1)\underbrace{(x+1)}_{\omega} =$

$= \omega^2+(x-1)\omega = \omega\big(\omega+(x-1)\big) = (x+1)\big((x+1)+(x-1)\big) =$

$= (x+1)(x+1+x-1) = (x+1)2x$