

Ex 1.6

$$1) (x-1)^2 - (y+1)^2 = x^2 - 2x + 1 - (y^2 + 2y + 1) = x^2 - 2x + 1 - y^2 - 2y - 1 = \underline{x^2 - y^2 - 2x - 2y}$$

$$2) (1+x)^2 - (1-x)^2 = 1 + 2x + x^2 - (1 - 2x + x^2) = 1 + 2x + x^2 - 1 + 2x - x^2 = \underline{4x}$$

$$\begin{aligned} 3) \left(\frac{1}{2}x + \frac{1}{2}y\right)^2 - \left(\frac{1}{2}x - \frac{1}{2}y\right)^2 &= \frac{1}{4}x^2 + \frac{1}{2}xy + \frac{1}{4}y^2 - \left(\frac{1}{4}x^2 - \frac{1}{2}xy + \frac{1}{4}y^2\right) \\ &= \frac{1}{4}x^2 + \frac{1}{2}xy + \frac{1}{4}y^2 - \frac{1}{4}x^2 + \frac{1}{2}xy - \frac{1}{4}y^2 = \underline{xy} \end{aligned}$$

$$\begin{aligned} 4) (2x+y)^2 + (2x-y)^2 - 2(2x+y)(2x-y) \\ &= 4x^2 + 4xy + y^2 + 4x^2 - 4xy + y^2 - 2(4x^2 - y^2) \\ &= 4x^2 + 4xy + y^2 + 4x^2 - 4xy + y^2 - 8x^2 + 2y^2 = \underline{4y^2} \end{aligned}$$

$$\begin{aligned} 5) (3x+y)(3x-y) - (3x+2y)^2 - (x-3y)^2 \\ &= 9x^2 - y^2 - (9x^2 + 12xy + 4y^2) - (x^2 - 6xy + 9y^2) \\ &= \underline{9x^2} - \underline{y^2} - \underline{9x^2} - \underline{12xy} - \underline{4y^2} - \underline{x^2} + \underline{6xy} - \underline{9y^2} = \underline{-x^2 - 14y^2 - 6xy} \end{aligned}$$

$$\begin{aligned} 6) (x+2)^2 - (x+1)^2 - (x+1)(x-1) - x(x+4) - 4 \\ &= x^2 + 4x + 4 - (x^2 + 2x + 1) - (x^2 - 1) - x^2 - 4x - 4 \\ &= \underline{x^2 + 4x + 4} - \underline{x^2 - 2x - 1} - \underline{x^2 + 1} - \underline{x^2 - 4x - 4} = \underline{-2x^2 - 2x} \end{aligned}$$