

$$\begin{aligned} 1 \textcircled{i} \quad (x+4)(x+10) \\ = x^2 + (4+10)x + 4 \times 10 \\ = x^2 + 14x + 40 \end{aligned}$$

$$\begin{aligned} 1 \textcircled{ii} \quad (x+8)(x-10) \\ = x^2 + (8-10)x + 8(-10) \\ = x^2 - 2x - 80 \end{aligned}$$

$$\begin{aligned} 1 \textcircled{iii} \quad (3x+4)(3x-5) \\ = (3x)^2 + (4-5)(3x) + 4(-5) \\ = 9x^2 - 3x - 20 \end{aligned}$$

$$\begin{aligned} 1 \textcircled{iv} \quad \left(y^2 + \frac{3}{2}\right)\left(y^2 - \frac{3}{2}\right) \\ = (y^2)^2 - \left(\frac{3}{2}\right)^2 \\ = y^4 - \frac{9}{4} \end{aligned}$$

$$\begin{aligned} 1 \textcircled{v} \quad (3-2x)(3+2x) \\ = 3^2 - (2x)^2 \\ = 9 - 4x^2 \end{aligned}$$

$$\begin{aligned} 2 \textcircled{i} \quad 103 \times 107 \\ = (100+3)(100+7) \\ = 100^2 + (3+7)100 + 3 \times 7 \\ = 10000 + 1000 + 21 \\ = 11021 \end{aligned}$$

$$\begin{aligned} 2 \textcircled{ii} \quad 95 \times 96 \\ = (100-5)(100-4) \\ = 100^2 + (-5-4)100 + (-5)(-4) \\ = 10000 - 900 + 20 \\ = 10020 - 900 \\ = 9120 \end{aligned}$$

$$\begin{aligned} 2 \textcircled{iii} \quad 104 \times 96 \\ = (100+4)(100-4) \\ = 100^2 - 4^2 \\ = 10000 - 16 \\ = 9984 \end{aligned}$$

$$\begin{aligned} 3 \textcircled{i} \quad 9x^2 + 6xy + y^2 \\ = (3x)^2 + 2 \times 3x \times y + y^2 \\ = (3x+y)^2 \\ = (3x+y)(3x+y) \end{aligned}$$

$$\begin{aligned} 3 \textcircled{ii} \quad 4y^2 - 4y + 1 \\ = (2y)^2 - 2 \times 2y \times 1 + 1^2 \\ = (2y-1)^2 \\ = (2y-1)(2y-1) \end{aligned}$$

$$\begin{aligned} 3 \textcircled{iii} \quad x^2 - \frac{y^2}{100} \\ = x^2 - \left(\frac{y}{10}\right)^2 \\ = \left(x - \frac{y}{10}\right)\left(x + \frac{y}{10}\right) \end{aligned}$$