

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

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

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

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

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

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

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

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

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

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

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