

$$\begin{aligned} \underline{1.} \quad & -6px^2 + 12px \\ & = -6px(x-2) \end{aligned}$$

$$\begin{aligned} \underline{2.} \quad & 4a^2 - 8ab^3 \\ & = 4a(a-2b^3) \end{aligned}$$

$$\begin{aligned} \underline{3.} \quad & 5a^2 - 125b^2 \\ & = 5(a^2 - 25b^2) \\ & = 5(a-5b)(a+5b) \end{aligned}$$

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

$$\begin{aligned} \underline{5.} \quad & x^2 + y^2 \\ & \text{Can NOT factorize} \end{aligned}$$

$$\begin{aligned} \underline{6.} \quad & \frac{e^2}{25} - \frac{f^2}{36} \\ & = \left(\frac{e}{5} - \frac{f}{6}\right)\left(\frac{e}{5} + \frac{f}{6}\right) \end{aligned}$$

$$\begin{aligned} \underline{7.} \quad & 2a^2b - ab - a \\ & = a(2ab - b - 1) \end{aligned}$$

$$\begin{aligned} \underline{8.} \quad & g^2 - 5g - 6 \\ & = (g-6)(g+1) \end{aligned}$$

$$\begin{aligned} \underline{9.} \quad & g^2 - 5g + 6 \\ & = (g-3)(g-2) \end{aligned}$$

$$\begin{aligned} \underline{10.} \quad & 15 + 10y - 4xy - 6x \\ & = 5(3+2y) - 2x(3+2y) \\ & = (3+2y)(5-2x) \end{aligned}$$

$$\begin{aligned} \underline{11.} \quad & 5x^2 - x \quad \text{and} \quad 5(y-3)^2 - (y-3) \\ & = x(5x-1) \quad = (y-3)(5(y-3)-1) \\ & \quad \quad \quad = (y-3)(5y-16) \end{aligned}$$

$$\begin{aligned} \underline{12.} \quad & (5y+1)^2 - 4(y-1)^2 \\ & = [(5y+1) - 2(y-1)][(5y+1) + 2(y-1)] \\ & = [5y+1-2y+2][5y+1+2y-2] \\ & = (3y+3)(7y-1) \\ & = 3(y+1)(7y-1) \end{aligned}$$

OR by simplifying first to get

$$\begin{aligned} & 21y^2 + 18y - 3 \\ & = 3(7y^2 + 6y - 1) \\ & = 3(7y-1)(y+1) \end{aligned}$$

13. $x^3 - z^3$
 $= (x - z)(x^2 + xz + z^2)$

14. $(2x - 3)^2 + 5(3 - 2x) - 14$
 $= (2x - 3)^2 - 5(2x - 3) - 14$
 $= [(2x - 3) - 7][(2x - 3) + 2]$
 $= (2x - 10)(2x - 1)$
 $= 2(x - 5)(2x - 1)$ OR by simplifying first to get
 $4x^2 - 22x + 10$
 $= 2(2x^2 - 11x + 5)$
 $= 2(2x - 1)(x - 5)$

15. $\frac{1}{x^{-2}} - \frac{6}{x^{-1}} + 9$
 $= x^2 - 6x + 9$
 $= (x - 3)(x - 3)$
 $= (x - 3)^2$

16. $\frac{x^3}{27} + \frac{y^3}{8}$
 $= \left(\frac{x}{3} + \frac{y}{2}\right)\left(\frac{x^2}{9} - \frac{xy}{6} + \frac{y^2}{4}\right)$
