

ANSWERS

①

$$\begin{aligned} & \frac{2}{x} + \frac{3}{(x+1)} + \frac{1}{2} \\ &= \frac{4(x+1)}{2x(x+1)} + \frac{3(2x)}{2x(x+1)} + \frac{1x(x+1)}{2x(x+1)} \\ &= \frac{4(x+1) + 6x + x(x+1)}{2x(x+1)} \\ &= \frac{4x+4+6x+x^2+x}{2x(x+1)} \\ &= \frac{x^2+11x+4}{2x(x+1)} \end{aligned}$$

②

$$\begin{aligned} & \frac{3}{(x-1)} + \frac{1}{3} + \frac{2}{(x-2)} \\ &= \frac{9(x-2)}{3(x-1)(x-2)} + \frac{1(x-1)(x-2)}{3(x-1)(x-2)} + \frac{6(x-1)}{3(x-1)(x-2)} \\ &= \frac{9(x-2) + 1 \left[\overset{x^2-3x+2}{(x-1)(x-2)} \right] + 6(x-1)}{3(x-1)(x-2)} \\ &= \frac{9x-18+x^2-3x+2+6x-6}{3(x-1)(x-2)} \\ &= \frac{x^2+12x-22}{3(x-1)(x-2)} \end{aligned}$$

③

$$\begin{aligned}
 & \frac{1}{(2x+1)} + \frac{2}{x} - \frac{1}{3} \\
 = & \frac{1(3x)}{3x(2x+1)} + \frac{6(2x+1)}{3x(2x+1)} - \frac{1x(2x+1)}{3x(2x+1)} \\
 = & \frac{3x + 6(2x+1) - x(2x+1)}{3x(2x+1)} \\
 = & \frac{3x + 12x + 6 - 2x^2 - x}{3x(2x+1)} \\
 = & \frac{-2x^2 + 14x + 6}{3x(2x+1)} \quad \swarrow \text{common factor of 2} \\
 = & \frac{2[-x^2 + 7x + 3]}{3x(2x+1)} \quad \swarrow
 \end{aligned}$$

④

$$\begin{aligned}
 & \frac{2}{(2x-1)} - \frac{3}{(x-2)} - \frac{1}{2} \\
 = & \frac{4(x-2)}{2(2x-1)(x-2)} - \frac{6(2x-1)}{2(2x-1)(x-2)} - \frac{1(2x-1)(x-2)}{2(2x-1)(x-2)} \\
 = & \frac{4(x-2) - 6(2x-1) - 1[2x^2 - 5x + 2]}{2(2x-1)(x-2)} \\
 = & \frac{4x - 8 - 12x + 6 - 2x^2 + 5x - 2}{2(2x-1)(x-2)} \\
 = & \frac{-2x^2 - 3x - 4}{2(2x-1)(x-2)} \quad \swarrow \text{common factor of -1} \\
 = & \frac{-1(2x^2 + 3x + 4)}{2(2x-1)(x-2)} \quad \swarrow
 \end{aligned}$$

$$(5) \quad \frac{3}{x} - \frac{2}{(2x-1)} - \frac{2}{5}$$

$$= \frac{15(2x-1)}{5x(2x-1)} - \frac{10x}{5x(2x-1)} - \frac{2x(2x-1)}{5x(2x-1)}$$

$$= \frac{15(2x-1) - 10x - 2x(2x-1)}{5x(2x-1)}$$

$$= \frac{30x - 15 - 10x - 4x^2 + 2x}{5x(2x-1)}$$

$$= \frac{-4x^2 + 22x - 15}{5x(2x-1)}$$