

$$\textcircled{1} \text{ a) } \frac{x+4}{x} \cdot \frac{x^2}{x^2+5x+4}$$

$$= \frac{x+4}{x} \cdot \frac{x^2}{(x+4)(x+1)}$$

$$= \frac{x}{x+1} ; x \neq -4, -1, 0$$

$$\text{b) } \frac{x^2+10x+16}{5x-10} \cdot \frac{x-2}{x^2+9x+8}$$

$$= \frac{(x+2)(x+8)}{5(x-2)} \cdot \frac{x-2}{(x+8)(x+1)}$$

$$= \frac{x+2}{5(x+1)} ; x \neq -8, -1, 2$$

$$\text{c) } \frac{2x^2-10x}{x^2-9x+20} \cdot \frac{x^2-8x+16}{4x^2}$$

$$= \frac{\cancel{2}x(x-5)}{(x-4)(x-5)} \cdot \frac{(x-4)(x-4)}{\cancel{2}x^2}$$

$$= \frac{x-4}{2x} ; x \neq 0, 4, 5$$

$$\text{d) } \frac{2x+4}{x+4} \cdot \frac{5x^2+21x+4}{10x+2}$$

$$= \frac{\cancel{2}(x+2)}{x+4} \cdot \frac{(5x+1)(x+4)}{\cancel{2}(5x+1)}$$

$$= x+2 ; x \neq -4, -\frac{1}{5}$$

$$\begin{aligned} \textcircled{2} \text{ a) } \frac{x^2-5x+6}{5} &\div \frac{x-3}{15} \\ &= \frac{(x-2)(x-3)}{5} \cdot \frac{15^3}{x-3} \\ &= 3(x-2) ; x \neq 3 \end{aligned}$$

$$\begin{aligned} \text{b) } \frac{x^2-5x+6}{8x^2+24x} &\div \frac{x-2}{4x+12} \\ &= \frac{(x-2)(x-3)}{8x(x+3)} \cdot \frac{4(x+3)}{x-2} \\ &= \frac{14(x-3)}{28x} \\ &= \frac{x-3}{2x} ; x \neq -3, 0, 2 \end{aligned}$$

$$\begin{aligned} \text{c) } \frac{x^2-2x+1}{x+1} &\div \frac{x^2-1}{x+1} \\ &= \frac{(x-1)(x+1)}{x+1} \cdot \frac{x+1}{(x-1)(x+1)} \\ &= \frac{x-1}{x+1} ; x \neq -1, 1 \end{aligned}$$

$$\begin{aligned} \text{d) } \frac{x^2+7x+12}{x^2+3x-10} &\div \frac{x^2-x-20}{x^2-25} \\ &= \frac{(x+3)(x+4)}{(x+5)(x-2)} \cdot \frac{(x-5)(x+5)}{(x-5)(x+4)} \\ &= \frac{x+3}{x-2} ; x \neq -5, -4, 2, 5 \end{aligned}$$