

$$\textcircled{1} (x+1)(x-1) \quad x(x-1)$$

$$d) x(x+1)(x-1)$$

$$\textcircled{2} \frac{(x+1)(x+1)}{(x+1)(x+1)} \cdot \frac{2(x+1)}{x+1} \quad \boxed{2}$$

$$\textcircled{3} \frac{x(x-4)}{(x+9)(x-2)} \cdot \frac{(x+9)(x-9)}{(x-9)(x-2)}$$

$$\frac{x(x-4)}{(x-2)^2}$$

$$\textcircled{4} \frac{\cancel{x+1}}{5xy} \cdot \frac{4x^2y}{\cancel{x+1}}$$

$$\frac{4x^2y}{5xy}$$

$$\frac{4x}{5}$$

$$\textcircled{5} \frac{(x+1)(x+3)}{(x+3)(x+5)} \cdot \frac{2(x+3)}{2(x+1)}$$

$$1$$

$$\begin{aligned}
 & \textcircled{6} \quad \frac{3(z^2 - 15 + 6)}{(z+2)(z-2)} \div \frac{(z-3)(z+1)}{(z+2)(z+2)} \\
 & \frac{3(z-2)(z-3)}{(z+2)(z-2)} \cdot \frac{(z+2)(z+2)}{(z-3)(z+1)} \\
 & \frac{3(z+2)}{z+1}
 \end{aligned}$$

$$\textcircled{7} \quad \frac{5}{x+3} - \frac{2}{x-2} = \frac{x-2}{x-2} \cdot \frac{x+5}{x+3}$$

$$\frac{5x+15}{(x+2)(x+3)} - \frac{2x-4}{(x+3)(x-2)}$$

$$\frac{3x+19}{(x-2)(x+3)}$$

$$\textcircled{11} \frac{1}{\frac{x}{9}} + \frac{1}{\frac{x}{9}} = \frac{4}{9} \cdot \frac{x}{x}$$

$$\frac{x}{9x} + \frac{9}{9x} = \frac{4x}{9x}$$

$$x + 9 = 4x$$

$$9 = 3x$$

$$\boxed{3 = x}$$

$$\textcircled{12} \frac{1}{x-4} = \frac{2}{x-2}$$

$$2x - 8 = x - 2$$

$$\boxed{x = 6}$$

$$\textcircled{3} \frac{2x}{\frac{3}{3}x-2} - \frac{1}{3} \cdot \frac{x-2}{x-2} = \frac{1}{3(x-2)}$$

$$\frac{6x}{3(x-2)} = \frac{x-2}{3(x-2)} = \frac{1}{3(x-2)}$$

$$6x - x + 2 = 1$$

$$5x + 2 = 1$$

$$5x = -1$$

$$\boxed{x = -1/5}$$

$$\textcircled{14} \frac{6}{\frac{y-2}{y-2} \cdot y+2} + \frac{1}{y-2} \cdot \frac{y+2}{y+2} = \frac{1(y+2)}{(y-2)(y+2)}$$

$$\frac{6y-12}{(y-2)(y+2)} + \frac{y+2}{(y-2)(y+2)} = \frac{y^2-4}{(y-2)(y+2)}$$

$$7y - 10 = y^2 - 4$$

$$y^2 - 7y + 6 = 0$$

$$(y-1)(y-6) = 0$$

$$\boxed{y=1 \quad y=6}$$

$$\frac{\textcircled{16}}{\frac{x-2}{x-2} \cdot \frac{5}{x+3}} + \frac{8}{x-2} \cdot \frac{x+3}{x+3}$$

$$\frac{6}{x+3} \cdot \frac{(x-2)}{(x-2)}$$

$$\frac{5x-10}{(x-2)(x+3)} + \frac{8x+24}{(x-2)(x+3)}$$

$$\frac{6x-12}{(x+3)(x-3)}$$

$$\frac{13x+14}{(x-2)(x+3)}$$

$$\frac{6x-12}{(x+3)(x-3)}$$

$$\Rightarrow \frac{13x+14}{\cancel{(x-2)}\cancel{(x+3)}} \cdot \frac{\cancel{(x+3)}\cancel{(x-2)}}{6x-12}$$

$$\frac{13x+14}{6x-12}$$