

Alg 2: Homework 22

$$\begin{aligned} \textcircled{1} \quad & \frac{7}{y^2-49} - \frac{6}{y^2-2y-35} \\ & = \frac{7}{(y+7)(y-7)} - \frac{6}{(y-7)(y+5)} \quad [LCO = (y+7)(y-7)(y+5)] \\ & = \frac{7}{(y+7)(y-7)} \left(\frac{y+5}{y+5} \right) - \frac{6}{(y-7)(y+5)} \left(\frac{y+7}{y+7} \right) \\ & = \frac{7y + 35 - 6y - 42}{(y+7)(y-7)(y+5)} \\ & = \frac{\cancel{(y-7)}}{(y+7)\cancel{(y-7)}(y+5)} = \boxed{\frac{1}{(y+7)(y+5)}} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & \frac{2y^2-6y}{y-7} \div \frac{3-y}{2y-14} \\ & = \frac{2y \overset{(-1)}{\cancel{(y-3)}}}{\cancel{(y-7)}} \cdot \frac{2 \cancel{(y-7)}}{(3-y)} = \boxed{-4y} \end{aligned}$$

$$\textcircled{3} \quad \frac{\left(x - \frac{1}{x}\right) x}{\left(\frac{1-x^2}{x}\right) x} = \frac{x^2-1}{1-x^2} = \boxed{-1}$$

$$\begin{aligned} \textcircled{4} \quad & \frac{\left(\frac{a}{b} - \frac{b}{a}\right) ab}{\left(1 - \frac{b}{a}\right) ab} = \frac{a^2 - b^2}{ab - b^2} \\ & = \frac{(a+b)(a-b)}{b(a-b)} = \boxed{\frac{a+b}{b}} \end{aligned}$$

$$\textcircled{5} \frac{\left(1 + \frac{7}{y+2}\right) (y-2)(y+2)}{\left(1 + \frac{3}{y+2}\right) (y-2)(y+2)}$$

$$= \frac{(y-2)(y+2) + 7(y+2)}{(y-2)(y+2) + 3(y-2)}$$

$$= \frac{y^2 - 4 + 7y + 14}{y^2 - 4 + 3y - 6}$$

$$= \frac{y^2 + 7y + 10}{y^2 + 3y - 10}$$

$$= \frac{\cancel{(y+5)}(y+2)}{\cancel{(y+5)}(y-2)} = \boxed{\frac{y+2}{y-2}}$$

$$\textcircled{6} \frac{\left(\frac{3}{b} - 1\right) b^0}{\left(1 - \frac{6}{b} + \frac{9}{b^2}\right) b^0}$$

$$= \frac{3b - b^2}{b^2 - 6b + 9}$$

$$= \frac{b(3-b)^{(-1)}}{(\cancel{b-3})(b-3)}$$

$$= \boxed{\frac{-b}{b-3}} \quad \text{or} \quad \frac{b}{3-b}$$