

**Đề bài**

Thực hiện các phép tính

$$\text{a) } \left( \frac{x^2}{y^2} + \frac{y}{x} \right) : \left( \frac{x}{y^2} - \frac{1}{y} + \frac{1}{x} \right);$$

$$\text{b) } \left( \frac{1}{x^2+4x+4} - \frac{1}{x^2-4x+4} \right) : \left( \frac{1}{x+2} + \frac{1}{x-2} \right)$$

**Đáp án lời giải**

$$\begin{aligned} \text{a) } & \left( \frac{x^2}{y^2} + \frac{y}{x} \right) : \left( \frac{x}{y^2} - \frac{1}{y} + \frac{1}{x} \right) = \frac{x^2 \cdot x + y \cdot y^2}{xy^2} : \frac{x^2 - xy + y^2}{xy^2} \\ & = \frac{x^3 + y^3}{xy^2} : \frac{x^2 - xy + y^2}{xy^2} = \frac{x^3 + y^3}{xy^2} \cdot \frac{xy^2}{x^2 - xy + y^2} \\ & = \frac{(x+y)(x^2 - xy + y^2)xy^2}{xy^2(x^2 - xy + y^2)} = x + y \end{aligned}$$

$$\begin{aligned} \text{b) } & \left( \frac{1}{x^2+4x+4} - \frac{1}{x^2-4x+4} \right) : \left( \frac{1}{x+2} + \frac{1}{x-2} \right) \\ & = \left[ \frac{1}{(x+2)^2} - \frac{1}{(x-2)^2} \right] : \frac{x-2+x+2}{(x+2)(x-2)} \\ & = \frac{(x-2)^2 - (x+2)^2}{(x+2)^2(x-2)^2} \cdot \frac{(x+2)(x-2)}{2x} \\ & = \frac{(x^2 - 4x + 4 - x^2 - 4x - 4)(x+2)(x-2)}{2x(x+2)^2(x-2)^2} \end{aligned}$$

(Rút gọn cả tử và mẫu cho  $(x+2) \cdot (x-2)$ )

$$= \frac{-8x}{2x(x+2)(x-2)} = \frac{4}{(x+2)(x-2)}$$