

Đề bài

Làm các phép tính sau:

a) $\frac{y}{2x^2-xy} + \frac{4x}{y^2-2xy};$

b) $\frac{1}{x+2} + \frac{3}{x^2-4} + \frac{x-14}{(x^2+4x+4)(x-2)};$

c) $\frac{1}{x+2} + \frac{1}{(x+2)(4x+7)};$

d) $\frac{1}{x+3} + \frac{1}{(x+3)(x+2)} + \frac{1}{(x+2)(4x+7)}$

Đáp án lời giải

$$\begin{aligned}
 \text{a) } \frac{y}{2x^2-xy} + \frac{4x}{y^2-2xy} &= \frac{y}{x(2x-y)} + \frac{4x}{y(y-2x)} \\
 &= \frac{y}{x(2x-y)} + \frac{-4x}{y(2x-y)} = \frac{y^2}{xy(2x-y)} + \frac{-4x^2}{xy(2x-y)} \\
 &= \frac{y^2-4x^2}{xy(2x-y)} = \frac{(y-2x)(y+2x)}{xy(2x-y)} = \frac{-(2x-y)(y+2x)}{xy(2x-y)} \\
 &= \frac{-(2x+y)}{xy}
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } \frac{1}{x+2} + \frac{3}{x^2-4} + \frac{x-14}{(x^2+4x+4)(x-2)} \\
 &= \frac{1}{x+2} + \frac{3}{(x-2)(x+2)} + \frac{x-14}{(x+2)^2(x-2)} \\
 &= \frac{(x+2)(x-2)}{(x+2)^2(x-2)} + \frac{3(x+2)}{(x-2)(x+2)^2} + \frac{x-14}{(x+2)^2(x-2)} \\
 &= \frac{x^2-4+3x+6+x-14}{(x+2)^2(x-2)} = \frac{x^2+4x-12}{(x+2)^2(x-2)} \\
 &= \frac{x^2-2x+6x-12}{(x+2)^2(x-2)} = \frac{x(x-2)+6(x-2)}{(x+2)^2(x-2)} \\
 &= \frac{(x-2)(x+6)}{(x+2)^2(x-2)} = \frac{x+6}{(x+2)^2}
 \end{aligned}$$

$$\begin{aligned}
 \text{c) } \frac{1}{x+2} + \frac{1}{(x+2)(4x+7)} \\
 &= \frac{4x+7}{(x+2)(4x+7)} + \frac{1}{(x+2)(4x+7)} \\
 &= \frac{4x+8}{(x+2)(4x+7)} = \frac{4(x+2)}{(x+2)(4x+7)} = \frac{4}{4x+7}
 \end{aligned}$$

$$\begin{aligned}
 \text{d) } \frac{1}{x+3} + \frac{1}{(x+3)(x+2)} + \frac{1}{(x+2)(4x+7)} \\
 &= \frac{x+2}{(x+3)(x+2)} + \frac{1}{(x+3)(x+2)} + \frac{1}{(x+2)(4x+7)} \\
 &= \frac{x+3}{(x+3)(x+2)} + \frac{1}{(x+2)(4x+7)} = \frac{1}{x+2} + \frac{1}{(x+2)(4x+7)} \\
 &= \frac{4x+7}{(x+2)(4x+7)} + \frac{1}{(x+2)(4x+7)} = \frac{4x+8}{(x+2)(4x+7)} \\
 &= \frac{4(x+2)}{(x+2)(4x+7)} = \frac{4}{4x+7}
 \end{aligned}$$