

$$\begin{aligned}
& \left(\frac{1}{(a-2)^2} - \frac{2}{a^2-4} + \frac{1}{(a+2)^2} \right) (a^2-4)^2 = \left(\frac{1}{(a-2)^2} - \frac{2}{(a+2)(a-2)} + \frac{1}{(a+2)^2} \right) (a^2-4)^2 = \\
& = \left(\frac{(a+2)^2}{(a-2)^2(a+2)^2} - \frac{2(a-2)(a+2)}{(a+2)^2(a-2)^2} + \frac{(a-2)^2}{(a+2)^2(a-2)^2} \right) (a^2-4)^2 = \frac{(a+2)^2 - 2(a-2)(a+2) + (a-2)^2}{(a-2)^2(a+2)^2} (a^2-4)^2 = \\
& = \frac{(a^2+4a+4) - 2(a-2)(a+2) + (a^2-4a+4)}{(a-2)^2(a+2)^2} (a^2-4)^2 = \frac{(a^2+4a+4) - (2a-4)(a+2) + (a^2-4a+4)}{(a-2)^2(a+2)^2} (a^2-4)^2 = \\
& = \frac{(a^2+4a+4) - (2a^2+4a-4a-8) + (a^2-4a+4)}{(a-2)^2(a+2)^2} (a^2-4)^2 = \frac{(a^2+4a+4) - (2a^2-8) + (a^2-4a+4)}{(a-2)^2(a+2)^2} (a^2-4)^2 = \\
& = \frac{a^2+4a+4-2a^2+8+a^2-4a+4}{(a-2)^2(a+2)^2} (a^2-4)^2 = \frac{16}{(a-2)^2(a+2)^2} (a^2-4)^2 = \frac{16(a^2-4)^2}{(a-2)^2(a+2)^2} = \\
& = \frac{16(a+2)^2(a-2)^2}{(a-2)^2(a+2)^2} = 16
\end{aligned}$$

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$$\begin{aligned}
& \left(\frac{9}{(x+3)^2} + \frac{18}{x^2-9} + \frac{9}{(x-3)^2} \right) \left(\frac{x-3}{3-x} \right)^2 = \left(\frac{9}{(x+3)^2} + \frac{18}{(x-3)(x+3)} + \frac{9}{(x-3)^2} \right) \left(\frac{x-3}{3-x} \right)^2 = \\
& = \left(\frac{9}{(x+3)^2} + \frac{18}{(x-3)(x+3)} + \frac{9}{(x-3)^2} \right) \left(\frac{x^2-3^2}{3x-x^3} \right)^2 = \left(\frac{9}{(x+3)^2} + \frac{18}{(x-3)(x+3)} + \frac{9}{(x-3)^2} \right) \left(\frac{x^2-9}{3x} \right)^2 = \\
& = \left(\frac{9(x-3)^2}{(x+3)^2(x-3)^2} + \frac{18(x+3)(x-3)}{(x-3)^2(x+3)^2} + \frac{9(x+3)^2}{(x-3)^2(x+3)^2} \right) \left(\frac{x^2-9}{3x} \right)^2 = \frac{9(x-3)^2 + 18(x+3)(x-3) + 9(x+3)^2}{(x+3)^2(x-3)^2} \left(\frac{x^2-9}{3x} \right)^2 = \\
& = \frac{9(x^2-6x+9) + 18(x+3)(x-3) + 9(x^2+6x+9)}{(x+3)^2(x-3)^2} \left(\frac{x^2-9}{3x} \right)^2 = \\
& = \frac{(9x^2-54x+81) + (18x+54)(x-3) + (9x^2+54x+81)}{(x+3)^2(x-3)^2} \left(\frac{x^2-9}{3x} \right)^2 = \\
& = \frac{(9x^2-54x+81) + (18x^2-54x+54x-162) + (9x^2+54x+81)}{(x+3)^2(x-3)^2} \left(\frac{x^2-9}{3x} \right)^2 = \\
& = \frac{(9x^2-54x+81) + (18x^2-162) + (9x^2+54x+81)}{(x+3)^2(x-3)^2} \left(\frac{x^2-9}{3x} \right)^2 = \frac{9x^2-54x+81+18x^2-162+9x^2+54x+81}{(x+3)^2(x-3)^2} \left(\frac{x^2-9}{3x} \right)^2 =
\end{aligned}$$

$$= \frac{36x^2}{(x+3)^2(x-3)^2} \left(\frac{x^2-9}{3x} \right)^2 = \frac{36x^2}{(x+3)^2(x-3)^2} \frac{(x^2-9)^2}{3^2 x^2} = \frac{36x^2}{(x+3)^2(x-3)^2} \frac{(x^2-9)^2}{9x^2} = \frac{36x^2(x^2-9)^2}{9(x+3)^2(x-3)^2 x^2} =$$

$$= \frac{4x^2(x^2-9)^2}{(x+3)^2(x-3)^2 x^2} = \frac{4x^2(x-3)^2(x+3)^2}{(x+3)^2(x-3)^2 x^2} = 4$$