

$$\textcircled{1} \frac{4x-4}{x-1}$$

$$\frac{4(x-1)}{(x-1)}$$

$$\frac{4(x-1)}{(x-1)}$$

$$\boxed{4}$$

$$\textcircled{2} \frac{x^2-4}{x+2}$$

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

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

$$\boxed{x-2}$$

$$\textcircled{3} \frac{3x^2-3x}{2x^3-2x^2}$$

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

$$\boxed{\frac{3}{2x}}$$

$$\textcircled{4} \frac{xm+2n+xn+2m}{2x+4}$$

$$\frac{x(m+n)+2(m+n)}{2(x+2)}$$

$$\frac{(x+2)(m+n)}{2(x+2)}$$

$$\frac{m+n}{2}$$

$$\textcircled{5} \frac{3x^2-6ax+3a^2}{6x^2-6ax}$$

$$\frac{3(x^2-2ax+a^2)}{6x(x-a)}$$

$$\frac{3(x-a)^2}{6x(x-a)}$$

$$\frac{3(x-a)}{2x}$$

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⑥

$$\frac{x^4 - 2^4}{x^4 + x^2 2 - x^2 2^2 - 2^3}$$

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

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

$$\frac{x^2 + 2^2}{x^2 + 2}$$

⑦

$$\frac{5x^2 - 5x + 5}{x^3 + 1}$$

$$\frac{5(x^2 - x + 1)}{(x+1)(x^2 - x + 1)}$$

$$\frac{5}{x+1}$$

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⑧

$$\frac{\frac{1}{2}x^2 + \frac{1}{8}}{\frac{1}{4}x^4 - \frac{1}{64}}$$

$$\frac{\frac{1}{2}x^2 + \frac{1}{8}}{\frac{1}{4}x^4 - \frac{1}{64}}$$

$$\frac{\frac{1}{2}\left(x^2 + \frac{1}{4}\right)}{\frac{1}{4}\left(x^4 - \frac{1}{16}\right)}$$

$$\frac{\frac{1}{2}\left(x^2 + \frac{1}{4}\right)}{\frac{1}{4}\left(x^4 - \frac{1}{16}\right)}$$

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

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

$$\left(\frac{\frac{1}{2}}{\frac{1}{4}} - \frac{\frac{1}{4}}{\frac{1}{4}}\right) \frac{1}{x^2 - \frac{1}{4}}$$

$$\frac{2}{x^2 - \frac{1}{4}}$$

⑨

$$\frac{x^6 + 1}{x^2 + 1}$$

Hago la división

$$\frac{(x^3 + 1)(x^3 - x^2 + 1)}{x^2 + 1}$$

$$x^4 - x^2 + 1$$

$$\textcircled{11} \frac{x^2 - y^2}{x - y}$$

$$\frac{(x - y)(x + y)}{x - y}$$

$$\boxed{x + y}$$

$$\textcircled{12} \frac{x^2 + 2xy + y^2}{x + y}$$

$$\frac{(x + y)^2}{(x + y)}$$

$$\frac{(x + y)^2}{(x + y)}$$

$$\boxed{x + y}$$

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$$\textcircled{13} \frac{a^2 - 4a + 4}{a - 2}$$

$$\frac{(a - 2)^2}{(a - 2)}$$

$$\frac{(a - 2)^2}{(a - 2)}$$

$$\boxed{a - 2}$$

$$\textcircled{14} \frac{a^3 + 3a^2b + 3ab^2 + b^3}{a^2 + 2ab + b^2}$$

$$\frac{(a + b)^3}{(a + b)^2}$$

$$\frac{(a + b)^3}{(a + b)^2}$$

$$\boxed{a + b}$$

$$\textcircled{15} \frac{(x^4 - y^4)}{(x^2 - y^2)}$$

$$\frac{(x^2 - y^2)(x^2 + y^2)}{(x^2 - y^2)}$$

$$\frac{(x^2 - y^2)(x^2 + y^2)}{(x^2 - y^2)}$$

$$\boxed{x^2 + y^2}$$

$$\textcircled{16} \frac{x^4 - y^4}{x^3 - x^2y + xy^2 - y^3}$$

$$\frac{(x^2 - y^2)(x^2 + y^2)}{x^2(x - y) + y^2(x - y)}$$

$$\frac{(x - y)(x + y)(x^2 + y^2)}{(x - y)(x^2 + y^2)}$$

$$\boxed{x + y}$$

$$(17) \frac{x^6 - y^6}{x^3 - y^3}$$

$$\frac{(x^3 - y^3)(x^3 + y^3)}{(x^3 - y^3)}$$

$$\frac{(x^3 - y^3)(x^3 + y^3)}{(x^3 - y^3)}$$

$$\boxed{x^3 + y^3}$$

$$(19) \frac{2x}{x+2} + \frac{4-x^2}{x^2+4x+4}$$

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

$$\frac{2x}{x+2} + \frac{2-x}{x+2}$$

$$\frac{2x - x + 2}{x+2}$$

$$\frac{x+2}{x+2}$$

$$1$$

$$(18) \frac{5x^2 - 10x + 5}{x^2 - 2x + 1}$$

$$\frac{5(x^2 - 2x + 1)}{(x^2 - 2x + 1)}$$

$$\boxed{5}$$

$$(20) \frac{x^2 - x}{x^2 - 1} - \frac{x - 2}{x + 1}$$

$$\frac{x(x-1)}{(x-1)(x+1)} - \frac{x-2}{x+1}$$

$$\frac{x(x-1)}{(x-1)(x+1)} - \frac{x-2}{x+1}$$

$$\frac{x}{x+1} - \frac{x-2}{x+1}$$

$$\frac{x - x + 2}{x+1}$$

$$\frac{2}{x+1}$$

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$$(21) \frac{a^2 + 6a + 9}{(a+3)^3} - \frac{a-3}{a^2-9} + \frac{3}{a+3}$$

$$\frac{(a+3)^2}{(a+3)^3} - \frac{a-3}{(a-3)(a+3)} + \frac{3}{(a+3)}$$

$$\frac{\cancel{(a+3)}^2}{(a+3)^3} - \frac{\cancel{(a-3)}}{(\cancel{a-3})(a+3)} + \frac{3}{a+3}$$

$$\frac{1}{a+3} - \frac{1}{a+3} + \frac{3}{a+3}$$

$$\boxed{\frac{3}{a+3}}$$

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$$(22) \frac{3x-2}{3} + \frac{4-5x}{5}$$

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

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

$$\frac{-6+3}{15}$$

$$\frac{-3}{15}$$

$$\boxed{-\frac{1}{5}}$$

$$(23) \frac{x+2}{x} + \frac{5-x^2}{x^2} + \frac{3-x^2}{x^3}$$

$$\frac{x^2(x+2) + x(5-x^2) + 1(3-x^2)}{x^3}$$

$$\frac{x^3 + 2x^2 + 5x - x^3 + 3 - x^2}{x^3}$$

$$\boxed{\frac{x^2 + 5x + 3}{x^3}}$$

$$\frac{-5 \pm \sqrt{25-4 \cdot 1 \cdot 3}}{2}$$

√ No tiene
un factor
para este
tipo de
ejercicios. Queda con esta.

$$\textcircled{24} \quad \frac{x-1}{x+1} + \frac{x+1}{x-1}$$

$$\frac{(x-1)(x-1) + (x+1)(x+1)}{(x+1)(x-1)}$$

$$\frac{x^2 - x - x + 1 + x^2 + x + x + 1}{x^2 - 1}$$

$$\frac{2x^2 + 2}{x^2 - 1}$$

$$\frac{2(x^2 + 1)}{x^2 - 1}$$

$$\textcircled{25} \quad \frac{3}{a+2} + \frac{a}{a^2-4} + \frac{2}{a-2}$$

Se es lo mismo que $(a-2)(a+2)$

$$\frac{3(a-2) + a + 2(a+2)}{(a+2)(a-2)}$$

$$\frac{3a + (-6) + a + 2a + 4}{(a+2)(a-2)}$$

$$\frac{6a - 2}{(a+2)(a-2)}$$

$$\frac{2(3a - 1)}{(a+2)(a-2)}$$

$$\textcircled{26} \quad \frac{-2}{a-2} + \frac{12a - 5a^2 - 4}{a^2 - 4a + 4}$$

Calculo Auxiliar

$$a = -5 \quad b = 12 \quad c = -4$$

$$\frac{-(-12) \pm \sqrt{(-9)^2 - 4(-5)(-4)}}{2(-5)}$$

$$\frac{-12 \pm \sqrt{\text{Valor Negativo}}}{-10}$$

No es factorizable

Continuo

$$\frac{-2}{a-2} + \frac{12a - 5a^2 - 4}{(a-2)^2}$$

$$\frac{-2(a-2) + 12a - 5a^2 - 4}{(a-2)^2}$$

$$\frac{-2a + 4 + 12a - 5a^2 - 4}{(a-2)^2}$$

$$\frac{-5a^2 + 10a}{(a-2)^2}$$

$$\frac{-5a(a-2)}{(a-2)^2}$$

$$\frac{-5}{(a-2)}$$

$$(27) \frac{4x}{x+1} + \frac{(2x+1)^2}{x^2-1}$$

$$\frac{4x}{x+1} + \frac{4x^2+4x+1}{(x-1)(x+1)}$$

$$\frac{4x(x-1) + 4x^2+4x+1}{(x-1)(x+1)}$$

$$\frac{4x^2-4x+4x^2+4x+1}{(x-1)(x+1)}$$

$$\boxed{\frac{1}{x^2-1}}$$

$$(29) \frac{2x^3+2x}{x^3} - \frac{3x+1}{x} + \frac{x-2}{x^2}$$

$$\frac{2x^3+2x - x^2(3x+1) + x(x-2)}{x^3}$$

$$\frac{2x^3+2x-3x^3-x^2+x^2-2x}{x^3}$$

$$\frac{-x^3}{x^3}$$

$$\boxed{-1}$$

$$(30) \frac{x+2}{x} - \frac{5}{2} - \frac{2x^2-3x}{x^2}$$

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

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

$$\frac{x+2-2x+6}{x} - \frac{5}{2}$$

$$\frac{-x+8}{x} - \frac{5}{2}$$

$$\frac{2(-x+8) - x \cdot 5}{2x}$$

$$\frac{-2x+16-5x}{2x}$$

$$\boxed{\frac{-7x+16}{2x}}$$

$$(28) \frac{x+3}{2} - \frac{4x+2}{4}$$

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

$$\frac{x+3}{2} - \frac{2x+1}{2}$$

$$\frac{x+3-2x-1}{2}$$

$$\boxed{\frac{-x+2}{2}}$$

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$$(31) \frac{x-2}{x+2} - \frac{x+2}{x-2}$$

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

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

$$\boxed{\frac{-8x}{(x^2-4)}}$$

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$$(32) \frac{3x}{x^2-9} - \frac{x}{x-3}$$

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

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

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

$$\boxed{\frac{-x^2}{x^2-9}}$$

$$(33) \frac{(a-2)}{(a+2)^3} - \frac{3}{a^2+4a+4}$$

$$\frac{(a-2)}{(a+2)^3} - \frac{3}{(a+2)^2}$$

$$\frac{(a-2) - 3(a+2)}{(a+2)^3}$$

$$\frac{a-2-3a-6}{(a+2)^3}$$

$$\frac{-2a-8}{(a+2)^3}$$

$$\boxed{\frac{-2(a+4)}{(a+2)^3}}$$

$$(34) \frac{x}{x+2} + \frac{x^2+4}{x^2+4x+4} - \frac{2x^2+4(2x+2)}{(x+2)^3}$$

$$\frac{x}{x+2} + \frac{x^2+4}{(x+2)^2} - \frac{2x^2+8x+8}{(x+2)^3}$$

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

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

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

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

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

$$35) \frac{x^2 + x - 2}{x^2 - 4} - \frac{x + 5}{x - 2}$$

$$-1 \pm \frac{\sqrt{1 - 4(1)(-2)}}{2 \cdot 1}$$

$$\frac{-1 \pm \sqrt{9}}{2}$$

$$\frac{-1 \pm 3}{2} \begin{cases} x_1 = -2 \\ x_2 = 1 \end{cases}$$

Aca averiguo las raíces de la función cuadrática

$$\frac{(x-1)(x+2)}{(x+2)(x-2)} - \frac{x+5}{x-2}$$

$$\frac{x-1}{x-2} - \frac{x+5}{x-2}$$

$$\frac{x-1-x-5}{x-2}$$

$$\boxed{\frac{-6}{x-2}}$$

$$36) \frac{1}{x-1} - \frac{1}{x^2 + 2x + 1} + 1 - \frac{x}{(x+1)^2}$$

$$\frac{1}{x-1} - \frac{1}{(x+1)^2} + 1 - \frac{x}{(x+1)^2}$$

$$\frac{x^2 + 2x + 1 - (x-1) + (x^2 + 2x + 1)(x-1) - x(x-1)}{(x+1)^2(x-1)}$$

$$\frac{x^2 + 2x + 1 - x + 1 + (x^3 - x^2 + 2x^2 - 2x + x - 1 - x^2 + x)}{(x+1)^2(x-1)}$$

$$\frac{x^3 + x^2 + x + 1}{(x+1)^2(x-1)}$$

$$\frac{x^2(x+1) + 1(x+1)}{(x+1)^2(x-1)} \rightarrow \frac{(x^2+1)(x+1)}{(x+1)^2(x-1)} \rightarrow \boxed{\frac{x^2+1}{x^2-1}}$$

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$$\textcircled{37} \quad \frac{x-6}{x^2-3x+9} - \frac{x^3}{x^3+27} + 1$$

$$\frac{x-6}{(x-3)^2} - \frac{x^3}{(x+3)(x^2-3x+9)} + 1$$

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

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

$$\frac{x^2 + 3x - 6x - 18 - x^3 + (x+3)(x^2 - 3x + 9)}{(x+3)(x-3)^2}$$

$$\frac{x^2 - 3x - 18 - x^3 + x^3 - 3x^2 + 9x + 3x^2 - 9x + 27}{(x+3)(x-3)^2}$$

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

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

$$\boxed{\frac{1}{x+3}}$$

Calculo Auxiliar

	1	0	0	27
-3		-3	9	-27
	1	-3	9	0

$$(x+3)(x^2-3x+9)$$

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$$(33) \quad \frac{x^2}{x+1} - \frac{x}{2} + \frac{x(x+1)}{2x-2}$$

$$\frac{x^2}{x+1} - \frac{x}{2} + \frac{x^2+x}{2(x-1)}$$

$$\frac{x^2(2)(x-1) - x(x-1)(x+1) + (x^2+x)(x+1)}{2(x-1)(x+1)}$$

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$$\frac{2x^3 - 2x^2 - x(x^2-1) + (x^3+x^2+x^2+x)}{2(x-1)(x+1)}$$

$$\frac{2x^3 - 2x^2 - x^3 + x + x^3 + x^2 + x^2 + x}{2(x-1)(x+1)}$$

$$\frac{3x^3 + 2x}{2(x-1)(x+1)}$$

$$\frac{2x(x^2+1)}{2(x-1)(x+1)}$$

$$\boxed{\frac{x(x^2+1)}{x^2-1}}$$

$$(39) \quad \frac{8}{x-2} - \frac{15}{x-1} - \frac{3}{x+3} + \frac{10}{x+1}$$

$$\frac{8(x-1)(x+3)(x+1) - 15(x-2)(x+3)(x+1) - 3(x-2)(x-1)(x+1) + 10(x-2)(x-1)(x+3)}{(x-2)(x-1)(x+3)(x+1)}$$

$$\frac{8(x^3-1)(x+3) - 15(x^2+3x-2x-6)(x+1) - 3(x-2)(x^2-1) + 10(x^2-x-2x+2)(x+1)}{(x-2)(x-1)(x+3)(x+1)}$$

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$$\frac{8(x^3+3x^2-x-3) - 15(x^2+x-6)(x+1) - 3(x^3-x-2x^2+2) + 10(x^2-3x+2)(x+1)}{(x-2)(x-1)(x+3)(x+1)}$$

$$\frac{8x^3 + 24x^2 - 8x - 24 - 15(x^3 + x^2 + x^2 + x - 6x - 6) - 3x^3 + 3x + 6x^2 - 6 + 10(x^3 + 3x^2)}{(x-2)(x-1)(x+3)(x+1)}$$

$$\frac{8x^3 + 24x^2 - 8x - 24 - 15x^3 - 30x^2 + 75x + 90 - 3x^3 + 6x^2 + 3x - 6 + 10x^3 - 70x + 60}{(x-2)(x-1)(x+3)(x+1)}$$

$$\frac{0x^3 + 0x^2 + 0x + 120}{(x-2)(x-1)(x+3)(x+1)}$$

$\frac{120}{(x-2)(x-1)(x+3)(x+1)}$

$$\textcircled{40} \quad 2x - \frac{7x^2 + 4}{(x+2)^2} - \frac{x-2}{x+2}$$

$$\frac{2x(x+2)^2 - 7x^2 - 4 - (x-2)(x+2)}{(x+2)^2}$$

$$\frac{2x(x^2 + 4x + 4) - 7x^2 - 4 - (x^2 - 4)}{(x+2)^2}$$

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$$\frac{2x^3 + 8x^2 + 8x - 7x^2 - 4 - x^2 + 4}{(x+2)^2}$$

$$\frac{2x^3 + 8x}{(x+2)^2}$$

$$\boxed{\frac{2x(x^2 + 4)}{(x+2)^2}}$$

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

$$\frac{x^2+x+1}{x^2(x+2)+1(x+2)} - \frac{1}{(x-1)(x+1)} + \frac{2}{x+2} + \frac{1+2}{x^3(x+2)-(x+2)}$$

$$\frac{x^2+x+1}{(x+1)(x+2)} - \frac{1}{(x-1)(x+1)} + \frac{2}{x+2} + \frac{1+2}{(x^2-1)(x+2)}$$

$$\frac{(x^2+x+1)(x-1) - (x+2) + 2(x+1)(x-1) + 1+2}{(x+1)(x+2)(x-1)}$$

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$$\frac{x^3 - x^2 + x^2 - x + x - 1 - x - 2 + 2x^2 - 2 + 1 + 2}{(x+1)(x+2)(x-1)}$$

$$\frac{x^3 + 2x^2 - x - 2}{(x+1)(x+2)(x-1)}$$

$$\frac{x^2(x+2) - 1(x+2)}{(x+1)(x+2)(x-1)}$$

$$\frac{(x^2-1)(x+2)}{(x+1)(x+2)(x-1)}$$

$$\frac{(x-1)(x+1)}{(x-1)(x+1)}$$

$$\boxed{1}$$

$$(42) \quad \frac{x+10}{x^2-4} + \frac{2x+4}{x^2+4x+4}$$

$$\frac{x+10}{(x-2)(x+2)} + \frac{2(x+2)}{(x+2)^2}$$

$$\frac{x+10}{(x-2)(x+2)} + \frac{2}{x+2}$$

$$\frac{x+10+2(x-2)}{(x+2)(x-2)}$$

$$\frac{x+10+2x-4}{(x-2)(x+2)}$$

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

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

$$\boxed{\frac{3}{x-2}}$$

$$(43) \quad \frac{2x+\frac{3}{2}}{2x+1} - \frac{x-\frac{1}{2}}{4x^2-1}$$

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

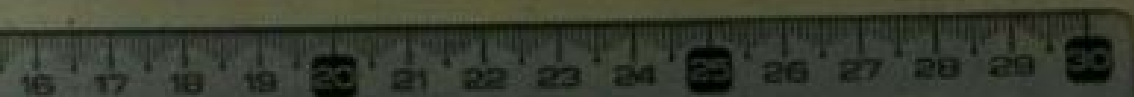
$$\frac{\left(2x+\frac{3}{2}\right)(2x-1) - \left(x-\frac{1}{2}\right)}{(2x+1)(2x-1)}$$

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

$$\frac{\cancel{4x^2}-1}{\cancel{4x^2}-1}$$

$$\boxed{1}$$

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$$(44) \quad \frac{x^2 + 1 + 2x}{x^2 + 1 + x} \cdot \frac{x^3 - 1}{x^2 - 1}$$

$$\frac{(x+1)^2}{(x^2+x+1)} \cdot \frac{(x-1)(x^2+x+1)}{(x-1)(x+1)}$$

$$\boxed{x+1}$$

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$$(45) \quad \frac{4-x^2}{2x-4} \cdot \frac{6}{x^2+4x+4}$$

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

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

$$\boxed{\frac{-3}{x+2}}$$

$$(46) \frac{x^2 + 5x + 2x + 5a}{x^2 + 25 + 10x} \cdot \frac{x^2 - a^2}{(x+a)^3} \cdot (x+5)$$

$$\frac{x(x+5) + a(x+5)}{(x+5)^2} \cdot \frac{(x-a)(x+a)}{(x+a)^3} \cdot (x+5)$$

$$\frac{(x+a)(x+5)}{(x+5)^2} \cdot \frac{(x-a)(x+a)}{(x+a)^3} \cdot \cancel{(x+5)}$$

$$\boxed{\frac{x-a}{x+a}}$$

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$$(47) \frac{x^2 + 2x + 1}{5x^2 + 5x + 5} \cdot \frac{x^3 - 1}{x^2 - 1} \quad \rightarrow \text{Sendo caso}$$

$$\frac{(x+1)^2}{5(x^2+x+1)} \cdot \frac{(x-1)(x^2+x+1)}{(x-1)(x+1)}$$

$$\boxed{\frac{x+1}{5}}$$

$$(43) \frac{x+2}{x^2-2x} \cdot \frac{x^2-4}{x^3-8} \cdot \frac{x^3+2x^2+4x}{x^2+4x+4}$$

$$\begin{array}{r|rrrr} 2 & 1 & 0 & 0 & -8 \\ & & 2 & 4 & 1 \\ \hline & 1 & 2 & 4 & 0 \end{array}$$

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

$$\boxed{\frac{1}{x-2}}$$

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$$(44) \frac{9x^2+12x+4}{3x+2} \cdot \frac{3x-2}{9x^3-6x^2+9x-6}$$

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

$$\frac{(3x+2)^2}{\cancel{(3x+2)}} \cdot \frac{\cancel{3x-2}}{3(x^2+1)(\cancel{3x-2})}$$

$$\boxed{\frac{3x+2}{3(x^2+1)}}$$

$$(50) \quad \frac{4}{x^2-9} \cdot \frac{x^2+9-6x}{2x^2-18} \cdot \frac{x^2+9}{2}$$

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

$$\boxed{\frac{x^2+9}{(x+3)^2}}$$

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$$(51) \quad \frac{x^2+2x}{3x^4+12x^2} \cdot \frac{x^4-16}{x^2+4+4x} \cdot \frac{6x}{4x+8}$$

$$\frac{x(x+2)}{3x^2(x^2+4)} \cdot \frac{(x^2-4)(x^2+4)}{(x+2)^2} \cdot \frac{6x}{4(x+2)}$$

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

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

$$\boxed{\frac{x-2}{2(x+2)}}$$

$$(52) \quad \frac{x^2 + 2x + 2x + 2a}{x^2 + 4x + 4} : \frac{(x+2)^2}{x^2 - 4}$$

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

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

$$\boxed{\frac{x-2}{x+2}}$$

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$$(53) \quad \frac{x^2 + 2x + 4}{(x+2)^3} : \frac{x^3 - 8}{x^2 - 4} \rightarrow \text{3er caso}$$

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

$$\boxed{\frac{1}{x+2}}$$

$$(54) \frac{x^4 - 16}{3x + 6} : \frac{\frac{4}{3}x^2 + \frac{4}{3}}{x - 2}$$

$$\frac{(x^2 - 4)(x^2 + 4)}{3(x + 2)} \cdot \frac{x - 2}{\frac{1}{3}(x^2 + 4)}$$

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

$$\boxed{x^2 - 4}$$

$$(56) \frac{x - 1}{x^2 - 1} : \frac{x + 1}{x + 1}$$

$$\cancel{x - 1} : \frac{(x - 1)(x + 1)}{(x + 1)}$$

$$\boxed{1}$$

$$(57) \frac{x - 1}{x^2 - 1} : \frac{x + 1}{x + 1}$$

$$\frac{x - 1}{(x - 1)(x + 1)} : x + 1$$

$$\boxed{\frac{1}{(x + 1)^2}}$$

$$(55) \frac{4x + 8}{x^2 - 4} : \frac{(x - 2)(x + 3)}{4x + 12}$$

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

$$\boxed{\frac{16}{x^2 - 4}}$$

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$$(58) \left(\frac{1}{x^2} - \frac{6}{x} + 9 \right) : \frac{3x-1}{x}$$

$$\frac{1 - 6x + 9x^2}{x^2} : \frac{3x-1}{x}$$

$$\frac{(3x-1)^2}{x^2} \cdot \frac{\cancel{x}}{\cancel{3x-1}}$$

$$\frac{3x-1}{x}$$

$$(59) \left(\frac{x^2 + 2x - 8}{x-2} - 2 \right) : 3$$

$$\left(\frac{x^2 + 2x - 8 - 2(x-2)}{(x-2)} \right) \cdot \frac{1}{3}$$

$$\frac{x^2 + 2x - 8 - 2x + 4}{(x-2)} \cdot \frac{1}{3}$$

$$\frac{x^2 - 4}{x-2} \cdot \frac{1}{3}$$

$$\frac{(\cancel{x-2})(x+2)}{(\cancel{x-2})} \cdot \frac{1}{3}$$

$$\boxed{\frac{x+2}{3}}$$

$$(60) \frac{\frac{x+2}{x-1} - \frac{x+1}{x-2}}{-\frac{6}{x-2}}$$

$$\frac{(x+2)(x-2) - (x+1)(x-1)}{(x-1)(x-2)} : \frac{-6}{(x-2)}$$

$$\frac{x^2 - 4 - x^2 + 1}{(x-1)(x-2)} \cdot \frac{(x-2)}{-6}$$

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

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$$\boxed{\frac{1}{2(x-1)}}$$

$$(61) \frac{x^2 - 2x + 1}{x^2 + 2x - 2 - 2} \cdot \frac{5}{x-1} + 1$$

$$\frac{(x-1)^2}{x(x+2) - (3+2)} \cdot \frac{5}{\cancel{x-1}} + 1$$

$$\frac{5(\cancel{x-1})}{(\cancel{x-1})(x+2)} + 1$$

$$\frac{5}{x+2} + 1$$

$$\frac{5 + 2 + 2}{x+2}$$

$$\boxed{\frac{3+7}{x+2}}$$

$$(62) \left(\frac{x+1}{x+2} - \frac{x+2}{x+1} \right) \cdot \frac{2+x}{2x+3}$$

$$\left(\frac{(x+1)(x+1) - (x+2)(x+2)}{(x+2)(x+1)} \right) \cdot \frac{2+x}{2x+3}$$

$$\frac{x^2 + 2x + 1 - x^2 - 4x - 4}{x+1} \cdot \frac{1}{2x+3}$$

$$= \frac{-2x - 3}{x+1} \cdot \frac{1}{2x+3}$$

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

$$\boxed{\frac{-1}{x+1}}$$

$$\boxed{\frac{x^2+3}{x^2-1}}$$

↑

$$(63) \left(\frac{x+1}{x-1} \right)^2 - 4(x-1)^{-1} \cdot \frac{x^2+1}{x^2-1}$$

$$\text{Rta: } \frac{(x^2+3)(x-1)}{(x-1)^2(x+1)}$$

$$\frac{(x+1)^2}{(x-1)^2} - \frac{4}{(x-1)} \cdot \frac{(x^2+1)}{(x^2-1)}$$

↑

$$\frac{(x+1)^2(x+1) - 4(x^2+1)}{(x-1)^2(x+1)}$$

$$\frac{x^2(x-1) + 3(x-1)}{(x-1)^2(x+1)}$$

$$\frac{(x^2+2x+1)(x+1) - 4x^2-4}{(x-1)^2(x+1)}$$

↑

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

$$\rightarrow \frac{x^3 - x^2 + 3x - 3}{(x-1)^2(x+1)}$$

$$(64) \sqrt{\frac{(x-3)^2}{9} + \frac{4x}{3}}$$

$$\sqrt{\frac{x^2 - 6x + 9 + 3(4x)}{9}}$$

$$\sqrt{\frac{x^2 + 6x + 9}{9}}$$

$$\sqrt{\left(\frac{x+3}{3}\right)^2}$$

$$\left(\frac{x+3}{3}\right)$$

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$$(65) \left(\frac{x+1}{x-1} - \frac{x-1}{x+1} \right) \cdot \frac{x+1}{x-1}$$

$$\left(\frac{(x+1)(x+1) - (x-1)(x-1)}{(x-1)(x+1)} \right) \cdot \frac{x+1}{x-1}$$

$$\frac{x^2 + 2x + 1 - x^2 + 2x - 1}{(x-1)} \cdot \frac{1}{x-1}$$

$$\left(\frac{4x}{(x-1)^2} \right)$$

$$(66) \left(\frac{x+1}{x-1} - \frac{x-1}{x+1} \right) : \left(\frac{x+1}{x-1} \right)$$

$$\frac{(x+1)(x+1) - (x-1)(x-1)}{(x-1)(x+1)} \cdot \frac{\cancel{x-1}}{x+1}$$

$$\frac{x^2 + 2x + 1 - x^2 + 2x - 1}{(x+1)^2}$$

$$\boxed{\frac{4x}{(x+1)^2}}$$

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$$(67) \frac{x-1}{x^2-4} \cdot \left(x + \frac{4-x^2}{x-1} \right)$$

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

$$\frac{\cancel{x-1}}{(x-2)(x+2)} \cdot \frac{x^2 - x + 4 - x^2}{\cancel{x-1}}$$

$$\boxed{\frac{-x+4}{x^2-4}}$$