Title

Math Solutions Consulting

1. Solución:

$\frac{(m−2)^{2}}{m^{2}−4}$
$\frac{(m−2)^{2}}{m^{2}−2^{2}}$
$\frac{(m−2)^{2}}{(m−2)(m+2)}$
$\frac{(m−2)^{2−1}}{m+2}$
$\frac{m−2}{m+2}$

2. Solución:

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

3. Solución:

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

4. Solución:

$\frac{a^{3}+1}{a^{4}−a^{3}+a−1}$
$\frac{(a+1)\left(a^{2}−a+1^{2}\right)}{a^{4}−a^{3}+a−1}$
$\frac{(a+1)\left(a^{2}−a+1\right)}{(a−1)\left(a^{3}+1\right)}$
$\frac{(a+1)\left(a^{2}−a+1\right)}{(a−1)\left(a^{3}+1^{3}\right)}$
$\frac{(a+1)\left(a^{2}−a+1\right)}{(a+1)\left(a^{2}−a+1^{2}\right)(a−1)}$
$\frac{(a+1)\left(a^{2}−a+1\right)}{(a−1)(a+1)\left(a^{2}−a+1\right)}$
$\frac{1}{a−1}$

5. Solución:

$\frac{a^{3}+1}{a^{4}−a^{3}+a−1}$
$\frac{(a+1)\left(a^{2}−a+1^{2}\right)}{a^{4}−a^{3}+a−1}$
$\frac{(a+1)\left(a^{2}−a+1\right)}{(a−1)\left(a^{3}+1\right)}$
$\frac{(a+1)\left(a^{2}−a+1\right)}{(a−1)\left(a^{3}+1^{3}\right)}$
$\frac{(a+1)\left(a^{2}−a+1\right)}{(a+1)\left(a^{2}−a+1^{2}\right)(a−1)}$
$\frac{(a+1)\left(a^{2}−a+1\right)}{(a−1)(a+1)\left(a^{2}−a+1\right)}$
$\frac{1}{a−1}$

6. Solución:

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

7. Solución:

$\frac{x^{2}+x−6}{(2x−7)^{2}}$
$\frac{(x+3)(x−2)}{(2x−7)^{2}}$

8. Solución:

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

9. Solución:

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

10. Solución:

$\left(\frac{x^{3}−121x}{x^{2}−49}\right)÷\left(\frac{x^{2}−11x}{x+7}\right)$
$\frac{\left(x^{3}−121x\right)(x+7)}{\left(x^{2}−49\right)\left(x^{2}−11x\right)}$
$\frac{(x+7)(x+11)\left(x^{2}−11x\right)}{\left(x^{2}−49\right)\left(x^{2}−11x\right)}$
$\frac{(x+7)(x+11)}{x^{2}−49}$
$\frac{(x+7)(x+11)}{(x−7)(x+7)}$
$\frac{x+11}{x−7}$

11. Solución:

$\frac{\left(−y^{2}−2y+8\right)\left(y^{2}−y−6\right)}{(2−y)\left(2y^{2}+12y+16\right)}$
$\frac{(y+2)(y−3)\left(−y^{2}−2y+8\right)}{\left(2y^{2}+12y+16\right)(2−y)}$
$\frac{(y+2)(y−3)\left(−y^{2}−2y+8\right)}{2\left(y^{2}+6y+8\right)(2−y)}$
$\frac{(y+2)(y−3)\left(−y^{2}−2y+8\right)}{2(y+4)(y+2)(2−y)}$
$\frac{−(y+4)(y−2)(y+2)(y−3)}{2(y+4)(y+2)(2−y)}$
$\frac{−(y−3)(y−2)}{2(2−y)}$
$\frac{−(y−3)(y−2)}{2×−(y−2)}$
$\frac{y−3}{2}$

12. Solución:

$\frac{1}{m^{3}−8}−\frac{1}{(m−2)^{3}}$
$\frac{\frac{(m−2)^{3}\left(m^{2}+2m+4\right)}{m^{3}−8}}{(m−2)^{3}\left(m^{2}+2m+4\right)}+\frac{−m^{2}−2m−4}{(m−2)^{3}\left(m^{2}+2m+4\right)}$
$\frac{\frac{(m−2)^{3}\left(m^{2}+2m+4\right)}{(m−2)\left(m^{2}+2m+4\right)}}{(m−2)^{3}\left(m^{2}+2m+4\right)}+\frac{−m^{2}−2m−4}{(m−2)^{3}\left(m^{2}+2m+4\right)}$
$\frac{(m−2)^{2}}{(m−2)^{3}\left(m^{2}+2m+4\right)}+\frac{−m^{2}−2m−4}{(m−2)^{3}\left(m^{2}+2m+4\right)}$
$\frac{(m−2)^{2}−4−2m−m^{2}}{(m−2)^{3}\left(m^{2}+2m+4\right)}$
$\frac{m^{2}−4m+4−4−2m−m^{2}}{(m−2)^{3}\left(m^{2}+2m+4\right)}$
$\frac{(−4m−2m)+\left(m^{2}−m^{2}\right)+(4−4)}{(m−2)^{3}\left(m^{2}+2m+4\right)}$
$\frac{−6m+\left(m^{2}−m^{2}\right)+(4−4)}{(m−2)^{3}\left(m^{2}+2m+4\right)}$
$\frac{−6m}{(m−2)^{3}\left(m^{2}+2m+4\right)}$

13. Solución:

$\frac{1}{(n−1)^{2}}+\frac{1}{n−1}−\frac{1}{(n−1)^{3}}−\frac{1}{n}$
$\frac{n(n−1)}{n(n−1)^{3}}+\frac{n(n−1)^{2}}{n(n−1)^{3}}−\frac{n}{n(n−1)^{3}}−\frac{(n−1)^{3}}{n(n−1)^{3}}$
$\frac{n(n−1)+n(n−1)^{2}−n−(n−1)^{3}}{n(n−1)^{3}}$
$\frac{−n+n^{2}+n^{3}−2n^{2}+n−n−(n−1)^{3}}{n(n−1)^{3}}$
$\frac{−\left(n^{3}−3n^{2}+3n−1\right)+n^{3}+\left(n^{2}−2n^{2}\right)+(−n+n−n)}{n(n−1)^{3}}$
$\frac{−\left(n^{3}−3n^{2}+3n−1\right)+n^{3}−n^{2}+−n}{n(n−1)^{3}}$
$\frac{−n^{3}+3n^{2}−3n+1+n^{3}−n^{2}−n}{n(n−1)^{3}}$
$\frac{\left(3n^{2}−n^{2}\right)+(−3n−n)+\left(−n^{3}+n^{3}\right)+1}{n(n−1)^{3}}$
$\frac{2n^{2}+−4n+\left(−n^{3}+n^{3}\right)+1}{n(n−1)^{3}}$
$\frac{2n^{2}−4n+1}{n(n−1)^{3}}$

14. Solución:

$\left(x+3−\frac{5}{x−1}\right)\left(x−2+\frac{5}{x+4}\right)$
$(\frac{x(x+4)}{x+4}−\frac{2(x+4)}{x+4}+\frac{5}{x+4})\left(x+3−\frac{5}{x−1}\right)$
($\frac{x(x+4)−2(x+4)+5}{x+4})\left(x+3−\frac{5}{x−1}\right)$
$\frac{\left.\left(x+3−\frac{5}{x−1}\right)\left(x^{2}+4x\right)−2(x+4)+5\right)}{x+4}$
$\frac{\left(x+3−\frac{5}{x−1}\right)\left(x^{2}+4x+−2x−8+5\right)}{x+4}$
$\frac{\left(x+3−\frac{5}{x−1}\right)\left(x^{2}+2x+−3\right)}{x+4}$
$\frac{(x+3)(x−1)\left(x+3−\frac{5}{x−1}\right)}{x+4}$
$\frac{(x+3)(x−1)}{x+4}\left[\frac{x(x−1)}{x−1}+\frac{3(x−1)}{x−1}−\frac{5}{x−1}\right]$
$\frac{(x+3)(x−1)}{x+4}\frac{x(x−1)+3(x−1)−5}{x−1}$
$\frac{\left.\left(x^{2}−x\right)+3(x−1)−5\right)(x+3)(x−1)}{(x−1)(x+4)}$
$\frac{\left.(3x−3)+x^{2}−x−5\right)(x+3)(x−1)}{(x−1)(x+4)}$
$\frac{\left(x^{2}+2x+−8\right)(x+3)(x−1)}{(x−1)(x+4)}$
$\frac{(x+4)(x−2)(x+3)(x−1)}{(x−1)(x+4)}$
$(x−2)(x+3)$

15. Solución:

$\frac{\frac{a+1}{a−1}+\frac{a−1}{a+1}}{\frac{a+1}{a−1}−\frac{a−1}{a+1}}$
$\frac{\frac{(a+1)^{2}}{(a−1)(a+1)}+\frac{(a−1)^{2}}{(a−1)(a+1)}}{\frac{a+1}{a−1}−\frac{a−1}{a+1}}$
$\frac{\frac{(a+1)^{2}+(a−1)^{2}}{(a−1)(a+1)}}{\frac{a+1}{a−1}−\frac{a−1}{a+1}}$
$\frac{\frac{(a+1)^{2}+(a−1)^{2}}{(a−1)(a+1)}}{\frac{a+1}{a−1}−\frac{a−1}{a+1}}$
$\frac{a^{2}+2a+1+(a−1)^{2}}{(a−1)(a+1)\left(\frac{a+1}{a−1}−\frac{a−1}{a+1}\right)}$
$\frac{a^{2}−2a+1+a^{2}+2a+1}{(a−1)(a+1)\left(\frac{a+1}{a−1}−\frac{a−1}{a+1}\right)}$
$\frac{\frac{\left(a^{2}+a^{2}\right)+(2a−2a)+(1+1)}{(a−1)(a+1)}}{\frac{a+1}{a−1}−\frac{a−1}{a+1}}$
$\frac{2a^{2}+(2a−2a)+(1+1)}{(a−1)(a+1)\left(\frac{a+1}{a−1}−\frac{a−1}{a+1}\right)}$
$\frac{\frac{2a^{2}+2}{(a−1)(a+1)}}{\frac{a+1}{a−1}−\frac{a−1}{a+1}}$
$\frac{2\left(a^{2}+1\right)}{(a−1)(a+1)\left(\frac{(a+1)^{2}}{(a−1)(a+1)}+\frac{−(a−1)(a−1)}{(a−1)(a+1)}\right)}$
$\frac{2\left(a^{2}+1\right)}{(a−1)(a+1)\left(\frac{(a+1)^{2}}{(a−1)(a+1)}+\frac{−(a−1)^{2}}{(a−1)(a+1)}\right)}$
$\frac{2\left(a^{2}+1\right)}{(a−1)(a+1)\frac{(a+1)^{2}−(a−1)^{2}}{(a−1)(a+1)}}$
$\frac{2\left(a^{2}+1\right)}{(a−1)(a+1)\frac{a^{2}+2a+1−(a−1)^{2}}{(a−1)(a+1)}}$
$\frac{a^{2}+1}{(a−1)(a+1)×\frac{2a}{(a−1)(a+1)}}$
$\frac{a^{2}+1}{2a}$

16. Solución:

$\frac{10x+4}{\frac{4}{x^{2}}−25}$
$\frac{2(5x+2)}{\frac{4}{x^{2}}−25}$
$\frac{2(5x+2)}{\frac{4}{x^{2}}−\frac{25x^{2}}{x^{2}}}$
$\frac{2(5x+2)}{\frac{4−25x^{2}}{x^{2}}}$
$\frac{2(5x+2)}{\frac{−\left(25x^{2}−4\right)}{x^{2}}}$
$\frac{2(5x+2)}{\frac{−(5x−2)(5x+2)}{x^{2}}}$
$\frac{2x^{2}(5x+2)}{−(5x−2)(5x+2)}$
$\frac{2x^{2}}{−(5x−2)}$
$\frac{−2x^{2}}{5x−2}$

17. Solución:

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

18. Solución:

$\frac{\left(2x^{2}+2x\right)\left(x^{2}−3x\right)}{2x^{2}\left(x^{2}−2x−3\right)}$
$\frac{\left(2x^{2}+2x\right)\left(x^{2}−3x\right)}{2x^{2}(x+1)(x−3)}$
$\frac{2x(x+1)x(x−3)}{2x^{2}(x+1)(x−3)}$
$\frac{xx(x−3)}{x^{2}(x−3)}$
$\frac{x^{1+1−2}(x−3)}{x−3}$
$1$

19. Solución:

$\left(\frac{a^{2}−27}{a^{2}−4}\right)÷\left(\frac{a^{2}+3a+9}{a−2}\right)$
$\frac{(a−2)\left(a^{2}−27\right)}{\left(a^{2}−4\right)\left(a^{2}+3a+9\right)}$
$\frac{\left(a^{2}−27\right)(a−2)}{\left(a^{2}+3a+9\right)(a+2)(a−2)}$
$\frac{a^{2}−27}{\left(a^{2}+3a+9\right)(a+2)}$

20. Solución:

$\frac{x}{x^{2}+x−2}−\frac{3}{x^{2}+2x−3}−\frac{x}{x^{2}+5x+6}$
$\frac{x}{(x+2)(x−1)}−\frac{3}{(x+3)(x−1)}−\frac{x}{(x+3)(x+2)}$
$\frac{x(x+3)}{(x−1)(x+2)(x+3)}−\frac{3(x+2)}{(x−1)(x+2)(x+3)}−\frac{x(x−1)}{(x−1)(x+2)(x+3)}$
$\frac{x(x+3)−3(x+2)−x(x−1)}{(x−1)(x+2)(x+3)}$
$\frac{3x+x^{2}+−3x−6−x(x−1)}{(x−1)(x+2)(x+3)}$
$\frac{x−x^{2}+x^{2}+3x−3x−6}{(x−1)(x+2)(x+3)}$
$\frac{(3x−3x+x)−6+\left(x^{2}−x^{2}\right)}{(x−1)(x+2)(x+3)}$
$\frac{x−6}{(x−1)(x+2)(x+3)}$

22. Solución:

$\frac{y^{3}}{27−y^{3}}−\frac{y}{3−y}$
$\frac{y^{3}}{−(y−3)\left(y^{2}+3y+9\right)}−\frac{y}{3−y}$
$−\frac{y^{3}}{(y−3)\left(y^{2}+3y+9\right)}−\frac{y}{3−y}$
$−\frac{y^{3}}{(y−3)\left(y^{2}+3y+9\right)}+\frac{−\frac{y(y−3)\left(y^{2}+3y+9\right)}{3−y}}{(y−3)\left(y^{2}+3y+9\right)}$
$−\frac{y^{3}}{(y−3)\left(y^{2}+3y+9\right)}+\frac{−\frac{y\left(y^{2}+3y+9\right)(y−3)}{(y−3)}}{(y−3)\left(y^{2}+3y+9\right)}$
$\frac{y\left(y^{2}+3y+9\right)−y^{3}}{(y−3)\left(y^{2}+3y+9\right)}$
$\frac{y\left(y^{2}−y^{2}+3y+9\right)}{(y−3)\left(y^{2}+3y+9\right)}$
$\frac{y(3y+9)}{(y−3)\left(y^{2}+3y+9\right)}$
$\frac{3y(y+3)}{(y−3)\left(y^{2}+3y+9\right)}$

23. Solución:

$\left(3−\frac{6}{x+2}\right)\left(1+\frac{1}{x}\right)÷\left(\frac{x+1}{2x+4}\right)$
$\frac{\left(3−\frac{6}{x+2}\right)\left(1+\frac{1}{x}\right)}{\frac{x+1}{2x+4}}$
$\frac{\left(1+\frac{1}{x}\right)(2x+4)}{x+1}\left(3−\frac{6}{x+2}\right)$
$\frac{2(x+2)\left(1+\frac{1}{x}\right)\left(3−\frac{6}{x+2}\right)}{x+1}$
$\frac{2(x+2)\left(3−\frac{6}{x+2}\right)}{x+1}(\frac{x}{x}+\frac{1}{x})$
$\frac{2(x+2)\left(3−\frac{6}{x+2}\right)}{x+1}\frac{x+1}{x}$
$\frac{2(x+1)(x+2)}{x(x+1)}\left[\frac{3(x+2)}{x+2}−\frac{6}{x+2}\right]$
$\frac{2(x+1)(x+2)}{x(x+1)}\left[\frac{3(x+2)−6}{x+2}\right]$
$\frac{2(x+1)(x+2)(3x+6−6)}{x(x+2)(x+1)}$
$\frac{2×3x(x+1)(x+2)}{x(x+2)(x+1)}$
$\frac{2×3x(x+2)}{x(x+2)}$
$2×3x^{1−1}(x+2)^{1−1}$
$6$

24. Solución:

$\left(\frac{x+3}{x−1}−x\right)\left(2x+\frac{x^{2}}{x+1}\right)÷\left(\frac{2x}{x−1}−x\right)$
$\frac{\left(\frac{x+3}{x−1}−x\right)\left(2x+\frac{x^{2}}{x+1}\right)}{\frac{2x}{x−1}−x}$
$\frac{\left(\frac{x+3}{x−1}−x\right)\left(2x+\frac{x^{2}}{x+1}\right)}{\left[\frac{2x}{x−1}−\frac{x(x−1)}{x−1}\right.}$
$\frac{\left(\frac{x+3}{x−1}−x\right)\left(2x+\frac{x^{2}}{x+1}\right)}{\frac{2x−x(x−1)}{x−1}}$
$\frac{\left(\frac{x+3}{x−1}−x\right)\left(2x+\frac{x^{2}}{x+1}\right)}{\frac{x(2−(x−1))}{x−1}}$
$\frac{\left(\frac{x+3}{x−1}−x\right)\left(2x+\frac{x^{2}}{x+1}\right)}{\frac{x(3−x)}{x−1}}$
$\frac{\frac{x+3}{x−1}−x}{\frac{x(3−x)}{x−1}}\left[\frac{2x(x+1)}{x+1}+\frac{x^{2}}{x+1}\right]$
$\frac{\frac{x+3}{x−1}−x}{\frac{x(3−x)}{x−1}}\left[\frac{2x(x+1)+x^{2}}{x+1}\right]$
$\frac{\frac{x(2(x+1)+x)\left(\frac{x+3}{x−1}−x\right)}{\frac{x(3−x)}{x−1}(x+1)}}{\frac{x(3−x)}{x−1}(x+1)}$
$\frac{x(2(x+1)+x)\left(\frac{x+3}{x−1}−x\right)}{\frac{x(3−x)}{x−1}(x+1)}$
$\frac{x\left(\frac{x+3}{x−1}−x\right)(2x+2+x)}{\frac{x(3−x)}{x−1}(x+1)}$
$\frac{x\left(\frac{x+3}{x−1}−x\right)(3x+2)}{\frac{x(3−x)}{x−1}(x+1)}$
$\frac{\frac{x(3x+2)}{x+1}}{\frac{x(3−x)}{x−1}}(\frac{x+3}{x−1}−\frac{x(x−1)}{x−1})$
$\frac{\frac{x(3x+2)}{x+1}}{\frac{x(3−x)}{x−1}}\left[\frac{3+x−x(x−1)}{x−1}\right]$
$\frac{x\left(x−x^{2}+x+3\right)(3x+2)}{\frac{x(3−x)}{x−1}(x−1)(x+1)}$
$\frac{−\left(x^{2}−2x−3\right)x(3x+2)}{\frac{x(3−x)}{x−1}(x−1)(x+1)}$
$−\frac{x(x+1)(x−3)(3x+2)(x−1)}{x(x−1)(3−x)(x+1)}$
$−\frac{(x+1)(x−3)(3x+2)}{(3−x)(x+1)}$
$\frac{−(x+1)^{1−1}(x−3)(3x+2)}{3−x}$
$\frac{−(x−3)(3x+2)}{3−x}$
$\frac{−(3x+2)(x−3)}{−(x−3)}$
$3x+2$

25. Solución:

$\frac{2x−6}{2x^{2}−18}$
$\frac{2(x−3)}{2x^{2}−18}$
$\frac{2(x−3)}{2\left(x^{2}−9\right)}$
$\frac{2(x−3)}{2(x−3)(x+3)}$
$\frac{1}{x+3}$

26. Solución:

$\frac{x^{3}−8}{x^{2}−4}$
$\frac{x^{3}−8}{x^{2}−2^{2}}$
$\frac{x^{3}−8}{(x−2)(x+2)}$
$\frac{x^{3}−2^{3}}{(x−2)(x+2)}$
$\frac{(x−2)\left(x^{2}+2x+2^{2}\right)}{(x−2)(x+2)}$
$\frac{(x−2)\left(x^{2}+2x+4\right)}{(x−2)(x+2)}$
$\frac{x^{2}+2x+4}{x+2}$

27. Solución:

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

28. Solución:

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

29. Solución:

$\frac{x^{2}−9(x−2)}{x−3(x−2)}$
$\frac{x^{2}+18−9x}{x−3(x−2)}$
$\frac{(x−3)(x−6)}{x−3(x−2)}$
$\frac{(x−3)(x−6)}{x+6−3x}$
$\frac{(x−3)(x−6)}{−2x+6}$
$\frac{(x−3)(x−6)}{2(3−x)}$
$\frac{(x−6)(x−3)}{2×−(x−3)}$
$\frac{x−6}{−2}$
$−\frac{1}{2}(x−6)$

30. Solución:

$\frac{x^{2}+x−6}{x^{2}+7x+12}$
$\frac{x^{2}+x−6}{(x+4)(x+3)}$
$\frac{(x+3)(x−2)}{(x+4)(x+3)}$
$\frac{x−2}{x+4}$

31. Solución:

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

32. Solución:

$\frac{\frac{1}{x−1}+\frac{2}{x+1}}{\frac{x−2}{x}+\frac{2x+6}{x+1}}$
$\frac{\frac{x+1}{(x−1)(x+1)}+\frac{2(x−1)}{(x−1)(x+1)}}{\frac{x−2}{x}+\frac{2x+6}{x+1}}$
$\frac{\frac{1+x+2(x−1)}{(x−1)(x+1)}}{\frac{x−2}{x}+\frac{2x+6}{x+1}}$
$\frac{2x−2+x+1}{(x−1)(x+1)\left(\frac{x−2}{x}+\frac{2x+6}{x+1}\right)}$
$\frac{\frac{(x+2x)+(1−2)}{(x−1)(x+1)}}{\frac{x−2}{x}+\frac{2x+6}{x+1}}$
$\frac{3x−1}{(x−1)(x+1)\left[\frac{(x−2)(x+1)}{x(x+1)}+\frac{x(2x+6)}{x(x+1)}\right]}$
$\frac{3x−1}{(x−1)(x+1)[\frac{x^{2}−x−2+x(2x+6)}{x(x+1)}]}$
$\frac{3x−1}{(x−1)(x+1)\frac{2x^{2}+6x+x^{2}−x−2}{x(x+1)}}$
$\frac{3x−1}{(x−1)(x+1)\frac{3x^{2}+5x−2}{x(x+1)}}$
$\frac{3x−1}{(x−1)(x+1)\frac{2(3x−1)+x(3−1)}{x(x+1)}}$
$\frac{3x−1}{(x−1)(x+1)\frac{(3x−1)(x+2)}{x(x+1)}}$
$\frac{x(3x−1)(x+1)}{(x+2)(3x−1)(x−1)(x+1)}$
$\frac{x}{(x−1)(x+2)}$

33. Solución:

$\frac{\frac{a}{a−b}−\frac{b}{a+b}}{\frac{a+b}{a−b}+\frac{a}{b}}$
$\frac{\frac{a}{a−b}−\frac{b}{a+b}}{\frac{b(a+b)}{b(a−b)}+\frac{a(a−b)}{b(a−b)}}$
$\frac{\frac{a}{a−b}−\frac{b}{a+b}}{\frac{b(a+b)+a(a−b)}{b(a−b)}}$
$\frac{\frac{a}{a−b}−\frac{b}{a+b}}{\frac{ab+b^{2}+a(a−b)}{b(a−b)}}$
$\frac{\frac{a}{a−b}−\frac{b}{a+b}}{\frac{ab+b^{2}+a^{2}−ab}{b(a−b)}}$
$\frac{\frac{a}{a−b}−\frac{b}{a+b}}{\frac{b^{2}+a^{2}+(ab−ab)}{b(a−b)}}$
$\frac{\frac{a(a+b)−b(a−b)}{(a−b)(a+b)}}{\frac{b^{2}+a^{2}}{b(a−b)}}$
$\frac{\frac{a^{2}+ab+b^{2}−ab}{(a−b)(a+b)}}{\frac{b^{2}+a^{2}}{b(a−b)}}$
$\frac{\frac{b^{2}+a^{2}}{(a−b)(a+b)}}{\frac{b^{2}+a^{2}}{b(a−b)}}$
$\frac{b\left(a^{2}+b^{2}\right)(a−b)}{(a−b)(a+b)\left(a^{2}+b^{2}\right)}$
$\frac{b(a−b)}{(a−b)(a+b)}$
$\frac{b}{a+b}$

34. Solución:

$\frac{\frac{x+3}{x+4}−\frac{x+1}{x+2}}{\frac{x−1}{x+2}−\frac{x−3}{x+4}}$
$\frac{\frac{(x+2)(x+3)}{(x+2)(x+4)}+\frac{(−x−1)(x+4)}{(x+2)(x+4)}}{\frac{x−1}{x+2}−\frac{x−3}{x+4}}$
$\frac{\frac{(x+2)(x+3)+(−x−1)(x+4)}{(x+2)(x+4)}}{\frac{x−1}{x+2}−\frac{x−3}{x+4}}$
$\frac{x^{2}+5x+6+(−x−1)(x+4)}{(x+2)(x+4)\left(\frac{x−1}{x+2}−\frac{x−3}{x+4}\right)}$
$\frac{6+5x+x^{2}+−x^{2}−5x−4}{(x+2)(x+4)\left(\frac{x−1}{x+2}−\frac{x−3}{x+4}\right)}$
$\frac{\frac{(6−4)+\left(x^{2}−x^{2}\right)+(5x−5x)}{(x+2)(x+4)}}{\frac{x−1}{x+2}−\frac{x−3}{x+4}}$
$\frac{2+\left(x^{2}−x^{2}\right)+(5x−5x)}{(x+2)(x+4)\left(\frac{x−1}{x+2}−\frac{x−3}{x+4}\right)}$
$\frac{2}{\frac{\frac{2}{(x+2)(x+4)}}{\frac{x−1}{x+2}−\frac{x−3}{x+4}}}$
$\frac{2}{(x+2)(x+4)\frac{(x−1)(x+4)+(3−x)(x+2)}{(x+2)(x+4)}}$
$\frac{2}{(x+2)(x+4)\frac{−x^{2}+x+6+x^{2}+3x−4}{(x+2)(x+4)}}$
$\frac{2}{(x+2)(x+4)\frac{4x+2}{(x+2)(x+4)}}$
$\frac{x+2}{\frac{2x+1}{x+4}(x+2)(x+4)}$
$\frac{(x+2)(x+4)}{(x+2)(2x+1)(x+4)}$
$\frac{1}{2x+1}$

35. Solución:

$\frac{\frac{m^{2}}{n}−\frac{m^{2}−n^{2}}{m+n}}{\frac{m−n}{n}+\frac{n}{m}}$
$\frac{\frac{m^{2}}{n}−\frac{m^{2}−n^{2}}{m+n}}{\frac{m(m−n)}{mn}+\frac{n^{2}}{mn}}$
$\frac{\frac{m^{2}}{n}−\frac{m^{2}−n^{2}}{m+n}}{\frac{m(m−n)+n^{2}}{mn}}$
$\frac{\frac{m^{2}}{n}−\frac{m^{2}−n^{2}}{m+n}}{\frac{m^{2}−mn+n^{2}}{mn}}$
$\frac{\frac{m^{2}}{n}+\frac{\sqrt{(n−m)(m+n)}}{m+n}}{\frac{m^{2}−mn+n^{2}}{mn}}$
$\frac{\frac{m^{2}}{n}+n−m}{\frac{m^{2}−mn+n^{2}}{mn}}$
$\frac{\frac{m^{2}}{n}−\frac{mn}{n}+\frac{n^{2}}{n}}{\frac{m^{2}−mn+n^{2}}{mn}}$
$\frac{\frac{m^{2}−mn+n^{2}}{n}}{\frac{m^{2}−mn+n^{2}}{mn}}$
$\frac{mn\left(m^{2}−mn+n^{2}\right)}{n\left(m^{2}−mn+n^{2}\right)}$
$m$

36. Solución.

$\frac{\frac{a^{2}}{b^{3}}+\frac{1}{a}}{\frac{a}{b}−\frac{b−a}{a−b}}$
$\frac{\frac{a^{3}}{ab^{3}}+\frac{b^{3}}{ab^{3}}}{\frac{a}{b}−\frac{b−a}{a−b}}$
$\frac{\frac{a^{3}+b^{3}}{ab^{3}}}{\frac{a}{b}−\frac{b−a}{a−b}}$
$\frac{(a+b)\left(a^{2}−ab+b^{2}\right)}{ab^{3}\left(\frac{a}{b}−\frac{b−a}{a−b}\right)}$
$\frac{(a+b)\left(a^{2}−ab+b^{2}\right)}{ab^{3}[\frac{a}{b}+\frac{a−b}{a−b}]}$
$\frac{(a+b)\left(a^{2}−ab+b^{2}\right)}{ab^{3}\left(\frac{a}{b}+1\right)}$
$\frac{(a+b)\left(a^{2}−ab+b^{2}\right)}{ab^{3}\left[\frac{a}{b}+\frac{b}{b}\right]}$
$\frac{(a+b)\left(a^{2}−ab+b^{2}\right)}{ab^{3}\left[\frac{a+b}{b}\right]}$
$\frac{b(a+b)\left(a^{2}−ab+b^{2}\right)}{ab^{3}(a+b)}$
$\frac{b^{1−3}\left(a^{2}−ab+b^{2}\right)}{a}$
$\frac{b^{−2}\left(a^{2}−ab+b^{2}\right)}{a}$
$\frac{a^{2}−ab+b^{2}}{ab^{2}}$

37. Solución:

$\frac{1+\frac{2x}{1+x^{2}}}{2x+\frac{2x^{5}+2}{1−x^{4}}}$
$\frac{\frac{x^{2}+1}{x^{2}+1}+\frac{2x}{x^{2}+1}}{2x+\frac{2x^{5}+2}{1−x^{4}}}$
$\frac{\frac{x^{2}+2x+1}{x^{2}+1}}{2x+\frac{2x^{5}+2}{1−x^{4}}}$
$\frac{(x+1)(x+1)}{\left(2x+\frac{2x^{5}+2}{1−x^{4}}\right)\left(x^{2}+1\right)}$
$\frac{(x+1)^{2}}{\left(x^{2}+1\right)\left(2x+\frac{2x^{5}+2}{1−x^{4}}\right)}$
$\frac{(x+1)^{2}}{\left(2x+\frac{2x^{5}+2}{−\left(x^{2}−1\right)\left(x^{2}+1\right)}\right)\left(x^{2}+1\right)}$
$\frac{(x+1)^{2}}{\left(2x+−\frac{2x^{5}+2}{(x−1)(x+1)\left(x^{2}+1\right)}\right)\left(x^{2}+1\right)}$
$\frac{(x+1)^{2}}{\left(2x+\frac{−2x^{4}+2x^{3}−2x^{2}+2x−2}{(x−1)\left(x^{2}+1\right)}\right)\left(x^{2}+1\right)}$
$\frac{(x+1)^{2}}{\frac{2x^{4}−2x^{3}+2x^{2}−2x−2+2x−2x^{2}+2x^{3}−2x^{4}}{(x−1)\left(x^{2}+1\right)}\left(x^{2}+1\right)}$
$\frac{(x+1)^{2}}{\frac{−2}{(x−1)\left(x^{2}+1\right)}\left(x^{2}+1\right)}$
$\frac{(x+1)^{2}(x−1)\left(x^{2}+1\right)}{−2\left(x^{2}+1\right)}$
$\frac{(x+1)^{2}(x−1)}{−2}$
$−\frac{1}{2}(x+1)^{2}(x−1)$

38. Solución:

$\frac{\frac{a+x}{a−x}−\frac{b+a}{b−x}}{\frac{2}{a−x}−\frac{2}{b−x}}$
$\frac{\frac{a+x}{a−x}−\frac{b+a}{b−x}}{\frac{2(b−x)}{(a−x)(b−x)}−\frac{2(a−x)}{(a−x)(b−x)}}$
$\frac{\frac{a+x}{a−x}−\frac{b+a}{b−x}}{\frac{2(b−x)−2(a−x)}{(a−x)(b−x)}}$
$\frac{\frac{a+x}{a−x}−\frac{b+a}{b−x}}{\frac{2b−2x+2x−2a}{(a−x)(b−x)}}$
$\frac{\frac{a+x}{a−x}−\frac{b+a}{b−x}}{\frac{2b−2a}{(a−x)(b−x)}}$
$\frac{\frac{a+x}{a−x}−\frac{b+a}{b−x}}{\frac{2(b−a)}{(a−x)(b−x)}}$
$\frac{\frac{(b−x)(a+x)}{(a−x)(b−x)}+\frac{(−a−b)(a−x)}{(a−x)(b−x)}}{\frac{2(b−a)}{(a−x)(b−x)}}$
$\frac{\frac{(b−x)(a+x)+(−a−b)(a−x)}{(a−x)(b−x)}}{\frac{2(b−a)}{(a−x)(b−x)}}$
$\frac{\frac{ab−ax+bx^{2}+a^{2}−ab+ax+bx}{(a−x)(b−x)}}{\frac{2(b−a)}{(a−x)(b−x)}}$
$\frac{\frac{−x^{2}+2bx−a^{2}}{(a−x)(b−x)}}{\frac{2(b−a)}{(a−x)(b−x)}}$
$\frac{\left(−a^{2}+2bx−x^{2}\right)(a−x)(b−x)}{2(b−a)(a−x)(b−x)}$
$\frac{−a^{2}+2bx−x^{2}}{2(b−a)}$

39. Solución.

$\frac{\frac{a}{a+x}−\frac{a}{2a+2x}}{\frac{a}{a−x}+\frac{a}{a+x}}$
$\frac{\frac{2a}{2(a+x)}−\frac{a}{2(a+x)}}{\frac{a}{a−x}+\frac{a}{a+x}}$
$\frac{a}{2(a+x)\left(\frac{a}{a−x}+\frac{a}{a+x}\right)}$
$\frac{a}{2(a+x)[\frac{a(a+x)}{(a−x)(a+x)}+\frac{a(a−x)}{(a−x)(a+x)}]}$
$\frac{a}{2(a+x)\frac{a(a+x)+a(a−x)}{(a−x)(a+x)}}$
$\frac{a}{2(a+x)\frac{a^{2}+ax+a^{2}−ax}{(a−x)(a+x)}}$
$\frac{a}{2(a+x)\frac{2a^{2}}{(a−x)(a+x)}}$
$\frac{a(a−x)(a+x)}{2×2a^{2}(a+x)}$
$\frac{a−x}{4a}$

40. Solución.

$\frac{1−\frac{7}{x}+\frac{12}{x^{2}}}{x−\frac{16}{x}}$
$\frac{\frac{x^{2}}{x^{2}}−\frac{7x}{x^{2}}+\frac{12}{x^{2}}}{x−\frac{16}{x}}$
$\frac{\frac{x^{2}−7x+12}{x^{2}}}{x−\frac{16}{x}}$
$\frac{(x−3)(x−4)}{x^{2}\left(x−\frac{16}{x}\right)}$
$\frac{(x−3)(x−4)}{x^{2}\frac{(x−4)(x+4)}{x}}$
$\frac{x(x−3)(x−4)}{x^{2}(x−4)(x+4)}$
$\frac{x^{1−2}(x−3)(x−4)}{(x−4)(x+4)}$
$\frac{x^{−1}(x−3)(x−4)}{(x−4)(x+4)}$
$\frac{x−3}{x(x+4)}$

41. Solución:

$\frac{\frac{1}{x+y+z}−\frac{1}{x−y+z}}{\frac{1}{x−y+z}−\frac{1}{x+y+z}}$
$\frac{\frac{1}{x+y+z}−\frac{1}{x−y+z}}{\frac{x+y+z}{(x−y+z)(x+y+z)}+\frac{−x+y−z}{(x−y+z)(x+y+z)}}$
$\frac{\frac{1}{x+y+z}−\frac{1}{x−y+z}}{\frac{x+y+z−x+y−z}{(x−y+z)(x+y+z)}}$
$\frac{\frac{1}{x+y+z}−\frac{1}{x−y+z}}{\frac{2y}{(x−y+z)(x+y+z)}}$
$\frac{\frac{x−y+z}{(x−y+z)(x+y+z)}+\frac{−x−y−z}{(x−y+z)(x+y+z)}}{\frac{2y}{(x−y+z)(x+y+z)}}$
$\frac{\frac{x−y+z−x−y−z}{(x−y+z)(x+y+z)}}{\frac{2y}{(x−y+z)(x+y+z)}}$
$\frac{\frac{−2y}{(x−y+z)(x+y+z)}}{\frac{2y}{(x−y+z)(x+y+z)}}$
$−1$

42. Solución.

$\frac{1}{x−\frac{x}{x−\frac{x^{2}}{x+1}}}$
$\frac{1}{x−\frac{x}{x−\frac{x^{2}}{x+1}}}$
$\frac{1}{x−\frac{x}{\frac{x(x+1)}{x+1}−\frac{x^{2}}{x+1}}}$
$\frac{1}{x−\frac{x}{\frac{x(x+1)−x^{2}}{x+1}}}$
$\frac{1}{x+−\frac{x(x+1)}{x(x+1)−x^{2}}}$
$\frac{1}{x−\frac{x(x+1)}{x^{2}+x−x^{2}}}$
$\frac{1}{x−\frac{x(x+1)}{x}}$
$\frac{1}{x+−(x+1)}$
$\frac{1}{x+[−x−1]}$
$\frac{1}{−1}$
$−1$

43. Solución.

$\frac{x−1}{x+2−\frac{x^{2}+2}{x−\frac{x−2}{x+1}}}$
$\frac{x−1}{x+2−\frac{x^{2}+2}{\frac{x(x+1)}{x+1}+\frac{2−x}{x+1}}}$
$\frac{x−1}{x+2−\frac{x^{2}+2}{\frac{x(x+1)+2−x}{x+1}}}$
$\frac{x−1}{x+2−\frac{x^{2}+2}{\frac{x^{2}+2}{x+1}}}$
$\frac{x−1}{x+2+−(x+1)}$
$\frac{x−1}{x+2+[−x−1]}$
$\frac{x−1}{(2−1)+(x−x)}$
$\frac{x−1}{1}$

44. Solución.

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

45. Solución:

$\left[\left(\frac{a^{2}−16a+64}{a^{2}−64}\right)\left(\frac{a^{3}−9a^{2}+8a}{2a^{2}−128}\right)\right]÷\left(\frac{a^{2}+a}{2}\right)$
$\frac{\left(a^{2}−16a+64\right)\left(a^{3}−9a^{2}+8a\right)}{\left(a^{2}−64\right)\left(2a^{2}−128\right)×\frac{a^{2}+a}{2}}$
$\frac{2\left(a^{2}−16a+64\right)\left(a^{3}−9a^{2}+8a\right)}{\left(a^{2}−64\right)\left(2a^{2}−128\right)\left(a^{2}+a\right)}$
$\frac{2\left(a^{2}−16a+64\right)\left(a^{3}−9a^{2}+8a\right)}{a(a+1)\left(a^{2}−64\right)\left(2a^{2}−128\right)}$
$\frac{2a\left(a^{2}−9a+8\right)\left(a^{2}−16a+64\right)}{a(a−8)(a+8)\left(2a^{2}−128\right)(a+1)}$
$\frac{2a(a−1)(a−8)\left(a^{2}−16a+64\right)}{a(a−8)(a+8)\left(2a^{2}−128\right)(a+1)}$
$\frac{2(a−8)(a−8)a(a−1)(a−8)}{a(a−8)(a+8)\left(2a^{2}−128\right)(a+1)}$
$\frac{2a(a−8)^{2}(a−1)(a−8)}{2\left(a^{2}−64\right)a(a−8)(a+8)(a+1)}$
$\frac{2a(a−8)^{2}(a−1)(a−8)}{2(a−8)(a+8)a(a−8)(a+8)(a+1)}$
$\frac{(a−8)^{2}(a−1)}{(a+8)(a−8)(a+8)(a+1)}$
$\frac{(a−8)^{2}(a+8)^{−1−1}(a−1)}{(a−8)(a+1)}$
$\frac{(a−1)(a−8)^{2−1}}{(a+1)(a+8)^{2}}$
$\frac{(a−1)(a−8)}{(a+1)(a+8)^{2}}$