



1. Resuelve la ecuación:

[Grado 3-A]

1. $x(2x^2-3)-4x^3-x^2+12x = x(2x+1)-12$
2. $2x^2(3x-2)+2(x+2)+9x^2+2x-7 = 8x^3$
3. $12x^2-2(x^3-x^2)-2 = 2x(3x-2)+x^3+7x$
4. $3x(x^2+x)-3x(2x-2)-6x^3+13x = 6-x^2$
5. $20x^2-x(2x^2-2x)-3x(3x-1) = 30x-18$
6. $3x(2x-3)+2x^2(x+1)-5x^3+4x = 3-3x^2$
7. $6x^3-3(x^2-x)-3x(x^2+2x)+7x^2 = 6x-2$
8. $x^2(2x+1)-3x^2(x+1)+3x^2 = x^3-15x+18$
9. $3(x^2-2x)+2x^2(x-1)+x^3+10x^2 = 4-14x$
10. $x^2(x+3)-2(2x^2-2)-4x^3 = 12-12x-3x^2$
11. $25x-7x^2-x(2x^2-2x)-9 = x^3-2(3x^2+x)$
12. $2x^2(x+2)+x^2(3x+3)-8x^3-12 = 8x-6x^2$
13. $2x^3-2x^2(2x+1)+2 = 2x(2x-3)-3x^2+3x$
14. $3x(2x-1)-3(2x^3-x^2)+3 = 6x^2-4x^3-11x$
15. $3x^3-3(2x^2-x)+11x^2 = 3x^2(2x-1)-2x+6$
16. $5x^3-2x(3x+3)+15x^2-3 = x^2(3x+2)-8x$
17. $3x(x-1)-3x^2(3x+3)+11x^3+6 = 3x^2-10x$
18. $x^2(3x-1)+3(2x+3)-6x^3-15x^2 = 29x+15$
19. $3x(2x-2)+2(3x-2)+2x^3+5x^2+18x = -13$
20. $4x^3-2x^2(3x+1)+14x = 2x(2x+3)-3x^2+3$
21. $3x(3x+3)+3x^2-x = 8x^3-3(2x^3-3x^2)+12$
22. $3x^3-2x(3x-2)-3(3x-3)+4x^2-22x+9 = 0$
23. $2x^2+27x+9 = 2(3x^3+3x^2)-3x(x-3)-4x^3$
24. $6x-11x^3-2x^2(x^2-3x) = 9-5x^2-x^3(2x+3)$

2. Resuelve la ecuación:

[Grado 3-B]

1. $4x-3x^2(x-3)-x(2x-1)-x^2 = 6x^3+2$
2. $x(2x-3)-2(3x-2)-3x^2+2 = 2x-6x^3$
3. $2(2x^2+x)+x(2x+2)-x^2 = 6x^3+2x+1$
4. $3(3x-1)-x^2-20x+9 = x^2(3x+3)-7x^3$
5. $3x(x^2+2)-2x(x-2)+x^3+2x^2 = 17x+3$
6. $7x^3-x(x^2+1)-2(2x^2+2)-2 = 6x-11x^2$
7. $10x^2-x^2(x-3)-2x(2x^2-1)-4 = x^3+2x$
8. $2x^2(3x+1)+4x^2-2 = x^2(3x-1)+9x^3-x$
9. $2x^2(x+3)-8x^3-5x^2 = 4-2(3x^2-1)-7x$
10. $10x-3(3x^2-3x)-3(2x^3-2x^2) = 6-2x^2$
11. $3(3x^3+2x^2)-2(2x-3)-x^2-8x = 3x^3+2$
12. $3x(3x-1)-34x^2-4 = 2(x^2-x)+9x^3+19x$
13. $20x^2-3x(3x-1)-2(2x^2-2)-6x^3-5 = 3x$
14. $4x^2-2x^2(2x+3)+2x = 5x^3-x^2(3x-3)-1$
15. $3x^2(x+3)+x(3x-3)-9x^3+20x = 17x^2-6$
16. $2(x-2)+9x^3+26x^2+30x = x(3x^2+x)-16$
17. $2-x(x^2+2x)-11x^3-16x^2 = x-3(x^3+2x^2)$
18. $17x-3x^2(x-1)-6 = 6x^3-x(3x^2-3x)-5x^2$
19. $9x^3-3(3x^2-3x)+5x^2-19x = 3x^2(x-1)+3$
20. $2(3x^2-x)-8x^3+23x = 18-2x(x^2-x)-9x^2$
21. $23x^2-9x^3-2x^2(3x+3)+5x = 3-3(3x^3-1)$
22. $6x^2-x(2x+2)+17x-9 = 8x^3-2x(2x^2+2x)$
23. $16x^2-14x^3+12x+3 = x(x^2-2)-3x^2(3x-1)$
24. $x^2(x^2-2)+3x(x-1)-x^4+6x^3-6x^2 = 14x-6$

3. Resuelve la ecuación:

[Grado 3-C]

1. $x(2x-3)+34x+39 = -x^2(x-1)-8x^2$
2. $x^3-2x(x^2+3)+5x^2 = 2(x-2)-x+17$
3. $2x(x-1)-7x^2-16x-24 = x^3-2(x-3)$
4. $2x^2(x-2)-x^3+9x^2-7 = 3(x+2)-10x$
5. $3x(2x-1)-x^3-3x^2+6 = 2(3x-2)+3x$
6. $x^3-x(3x+1)+4x^2-6x = 39-2(x^2+x)$
7. $x^2-x^2(3x-2)-x(x^2+3x) = x-3x^3-10$
8. $2(2x^2-1)-3(2x-3)-17 = x^3+8x^2+3x$
9. $3x(3x-2)-x^3-11x+21 = 4x^2-2(3x-3)$
10. $x^2(x+1)-5x^2+19x-13 = 2x^3-x^2(2x-3)$
11. $2x^2(3x-2)-2(2x+3)-7x^3-x^2-24 = 12x$
12. $3(x^3-3x^2)+7x^2-6x+20 = x^2(x-2)+3x^3$

4. Resuelve la ecuación:

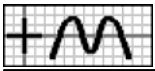
[Grado 4-A]

1. $3x^3(x-1)+11x^3-3x^2-9x+10 = 3(x+2)$
2. $2x^3(x-3)-2x^3(x+1)-3x^4+10x = 2x^3-3$
3. $2x(x-1)-x^3(2x+3)+6x^3-25x = 81-25x^2$
4. $2x^3(x-3)+3(3x^2-1)+3x^3+9x = 23x^2-21$
5. $2x^2(x-2)-x^2(x-3)-2x^4+3x^2+13x-6 = 8x^3$
6. $3x(x+3)+2x^4+5x^3-3x^2-17x = 11-3(x+3)$
7. $x(3x-1)-2x^3-19x^2-4x+6 = 3(3x+3)-3x^4$
8. $2(x^4-2x^3)+2x(2x-2)-x^3+x^2-2 = 5x^4-9x$
9. $12x^2-2x-6 = 3x^2(2x^2-x)+3(2x^2+x)-4x^4$
10. $3x(x^2-x)-x^3(x-3)+4x^4+6x^2-11x = 6-5x^3$
11. $6x^2-2x^2(x^2+x)-x^4-6x^3-3(2x-1)+14x = 6$
12. $x^3(x+3)+2x^3(x+3)-x^4-10x^3+9x+9 = 19x^2$
13. $3x(2x^3-2x^2)-8x^4+7x^3+17x^2 = x(x-3)+18$
14. $3x^3(3x-1)-7x^4+2x^3-2 = 8x^2-x(2x-3)-10x$
15. $3x^4-3(3x+1)-2x(2x^2+x)+9x^2-8x = 3-17x^3$
16. $x^3(x+2)+2(x-3)-4x^4+14x+3 = 26x^2-14x^3$
17. $3x^2(2x-2)-x^3(2x+2)+45x-18 = 34x^2-11x^3$
18. $x^3(2x+2)-3x^4-12x^2+6 = 7x-7x^3-3x^3(x-2)$
19. $7x^3-3x(2x^2+2)-2(2x-3)+11x^2-18 = 2x^4-6x$
20. $4x-x^2(3x-1)-2x^4-4 = 3x^2(3x+2)-11x^3-14x^2$
21. $x^3(3x+3)+8x^3-13x-6 = 3x^2(2x-3)+6x^4-8x^2$
22. $6-2x^3(x+3)-11x^3-x-2x(x^3-3x^2) = 16x^2-2x^4$
23. $12x^3-3x^4-x(x^2+3x)+24 = 48x-2x(x+2)-7x^2$
24. $x^2(x-1)-3(3x^3-x^2)+2x^4+3x^3+15x+18 = 12x^2$

5. Resuelve la ecuación:

[Grado 4-B]

1. $x(x^2+3)+x^3(3x+3)-11x^3+3x^2 = 9x^4+1$
2. $3x^3-x^3(3x+1)-2x^3(x+1)+2x = 3-9x^2-x^4$



3. $3(x-2)+2x(x-1)-6x^4+11x^2+15x-6 = 11x^3$
5. $3(3x+3)-3x^3(x+3)-5x-6 = 7x^2-5x^3-7x^4$
7. $9x^4-x^2(3x^2+x)-6x^3-18x^2 = 3(x+1)-16x-9$
9. $2x(3x^2-x)-3x^3(x+1)+x+2 = 12x^2-9x^4-2x^3$
11. $28x^3-3(3x^3-x^2)-x^2-23x-3 = 6x^4-3(2x+3)$
13. $3(x^3-x)-x(x^2+3)-6x^4-48x^2 = 6-35x-29x^3$
15. $3(x-3)-2x^3(3x+2)-3x^4+7x^2+13x = 14x^3-13$
17. $2x^2(2x-1)-x(2x^2+x)+9x^4+4x^2-2 = 17x^3-7x$
19. $21x^3-x(2x+3)-49x+12 = 10x^4-x^3(x-3)-45x^2$
21. $2(3x^2-x)+8x^3+9x^2-14x-12 = 2x^2(2x-2)+4x^4$
23. $3x^4-3x^3(2x-1)-3(x^4+3x^3)-40x^2 = 25x^3+x-6$

4. $3(2x-1)-x^3(x-3)-5x^4-10x^3 = 3x-12x^2-1$
6. $3(x-2)-x^3(x+3)+12x+15 = 35x^2-7x^4-8x^3$
8. $3(3x^2+3)-x^3(2x-3)+39x = 4x^4+2x^3-28x^2$
10. $2x^3(x+3)+4x^4-2x^2-46x = 26-13x^3-2(x+1)$
12. $36-x^2(2x-2)-6x^4-51x^2 = 3(x^3+2x^2)-40x^3$
14. $3x^3(x-1)-2x^3-56x^2-9x = x^4-2x^3(2x+3)-18$
16. $9x^4-3(x^4+x^3)-8x^2-33x-16 = 2(3x+1)-22x^3$
18. $4x^4-3(x^2-x)+14x^2-9 = 21x-12x^3-2x^2(2x-2)$
20. $23x^3-3x^3(3x+1)-16x^2-7x+6 = 3x^2(x-2)-3x^4$
22. $x^3(2x+2)-2x^2(x^2-3)+6x^4-17x^2+13x = 7x^3+3$
24. $2x^2(3x-3)-11x^3+36x^2-3 = 6x^4-3(3x+3)+34x$

6. Resuelve la ecuación:

[Grado 4-C]

1. $3x^3(2x-1)+3(x-1)-5x^4+9x^2-7 = 5x-5x^3$
3. $x^3(x-1)-3(x-2)-5x^2+28x+20 = 2x^4+4x^3$
5. $2x(2x^2-1)-x^2-9x-10 = 2x^4-x^3(x-3)+2x^3$
7. $x^4-2x^3(x-3)-9x^3-6x^2-32x = 3(2x+3)+51$
9. $x^4+8x^3+4x^2-7 = 3(3x^3+x^2)+3(3x+1)-18x$
11. $2x^4-x^2(3x^2-3)-6x^2-4x = x^2(3x+3)+x^3-15$
2. $x(x^3+3x^2)+x^2(3x-2)+3x^2+10 = 5x^3-11x$
4. $30-2x^2(3x-2)-3x^3(3x-3)-5x^2 = 7x-8x^4$
6. $3x^3(x-3)+12x^3+x^2-x = 2(3x^2-x)+4x^4-10$
8. $2x^3(x-1)-3x^4-x^3+28x+84 = 3x^2-3(3x-2)$
10. $x^2(2x-3)-x^2(2x-2)-3x^4+4x = 14x^2-x^3-13$
12. $2x(2x-1)+2(3x^2+2x)+x^4+2x^2+4x = 6x^3+13$

7. Resuelve la ecuación:

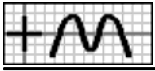
[Grado 3-A]

1. $\frac{2}{3}x^3 - \frac{3x^2+2}{6} = \frac{x(2x^2-1)}{2} - x^2$
2. $\frac{x^2(4x+1)}{12} - x = \frac{x^2(x+1)}{2} - \frac{8x-1}{12}$
3. $x^3 - \frac{x^2(x+2)}{5} - \frac{3(x^2-3)}{10} = \frac{3x^3}{5}$
4. $\frac{x}{6} - 3x-1 = \frac{x^2(x+3)}{3} - \frac{5x^2(x+2)}{6}$
5. $\frac{x(x^2+2)}{2} - \frac{x^2(7x-8)}{20} = x - \frac{7x+2}{20}$
6. $1 - \frac{x^2(x-1)}{2} - \frac{5x(x+4)}{12} = \frac{x^3}{4} - x^3$
7. $\frac{1}{2} - \frac{x^2(3x+1)}{2} = 1-x - \frac{5x^2(2x+1)}{8}$
8. $\frac{1}{15} + x^2 = \frac{x^2(3x+2)}{3} - \frac{x(11x^2+3)}{10}$
9. $x^3 - \frac{15x^3-4}{27} - \frac{x^2(3x-1)}{9} = \frac{10x^2}{27}$
10. $3x - \frac{x(3x^2+2)}{2} + 2 = \frac{1}{2} - \frac{x^2(7x+1)}{6}$
11. $1 - \frac{7x+3}{6} = \frac{x^2(3x-2)}{3} - \frac{x^2(9x-11)}{6}$
12. $\frac{5x^2+1}{9} + \frac{x^2(x+1)}{3} - \frac{x(3x^2-1)}{6} = x^2$
13. $\frac{4x^3-1}{6} + \frac{x^2(3x+1)}{2} - \frac{x(x-1)}{12} = 2x^3$
14. $x^2 - \frac{x^2(x+2)}{9} - \frac{17x^2-21}{27} = 1 - \frac{17x}{27}$
15. $\frac{x^3-3}{6} - \frac{x(x^2-2)}{3} - \frac{x(7x-5)}{12} = -x^2+x$
16. $\frac{2}{3}x-4x-1 = \frac{x(3x^2-1)}{2} - \frac{x^2(7x-11)}{6}$
17. $2x^3 - \frac{3x(x^2+1)}{2} - \frac{6x^3-7}{8} = 2 - \frac{11x^2}{8}$
18. $x^2 - \frac{x^2(x+5)}{10} + \frac{x^2(2x+3)}{5} = \frac{2(1-2x)}{5}$
19. $\frac{3x(x^2+2)}{4} - x^2+2 = \frac{x(x^2+3)}{2} - \frac{x^2-7}{8}$
20. $\frac{x^2(x+2)}{3} - \frac{2x^2(3x-5)}{27} - x^2 = \frac{3x+1}{27}$
21. $\frac{2(2x+1)}{5} = x^2 - \frac{x^2(x+5)}{10} + \frac{x^2(2x-3)}{5}$
22. $\frac{x^2(2x+3)}{2} - \frac{3x^2(2x+1)}{5} = x - \frac{3(x-2)}{10}$
23. $x - \frac{13x-9}{15} - \frac{x^2(2x+1)}{10} = 1 - \frac{2x^2(x+2)}{15}$
24. $2x^2 - \frac{x^2(2x+3)}{4} - \frac{x(2x-5)}{8} = x - \frac{x^3-2}{8}$

8. Resuelve la ecuación:

[Grado 3-B]

1. $\frac{x^2(x-1)}{2} - \frac{(x+1)(x-1)}{12} = x^3$
2. $\frac{2(2x+1)}{3} - \frac{3x^2(x-1)}{2} = 4x^2$
3. $\frac{2x(x^2-1)}{5} - \frac{19x}{10} = x^3 - \frac{25x^2+6}{10}$
4. $\frac{x^2(x+1)}{2} - \frac{x^2(x+1)}{10} = x+1 - \frac{5x+7}{10}$
5. $\frac{x^2(3x+1)}{6} - \frac{11x-10}{12} = 1-x - \frac{11x^2}{12}$
6. $\frac{x^2(3x-2)}{2} - \frac{x^2(21x+11)}{18} = \frac{1}{2} - 2x$



$$7. \frac{x^2(x-1)}{5} + \frac{17x^2}{30} = x+1 - \frac{27x+28}{30}$$

$$8. 1 + \frac{x(x^2+1)}{2} - \frac{x^2(4x-25)}{20} = \frac{4-11x}{10}$$

$$9. x - \frac{x^2(x-1)}{3} - \frac{x^2(2x+1)}{12} = \frac{5x+6}{12}$$

$$10. \frac{25x+2}{8} + \frac{x^2(x-3)}{4} = 1 - \frac{x^2(4x-17)}{8}$$

$$11. \frac{x^2(3x-1)}{4} - \frac{3(x^3+2)}{16} = 2x^2 - \frac{29x}{16}$$

$$12. 1-x - \frac{x^2(12x-25)}{30} = \frac{7}{10} - \frac{3x^2(x-1)}{5}$$

$$13. \frac{3}{4} + \frac{3x(x^2+1)}{2} - \frac{7x(2x^2+1)}{12} = x^2+1$$

$$14. \frac{7x}{12} - x^2 - 1 = \frac{x^2(2x+1)}{8} - \frac{7(2x^2+3)}{24}$$

$$15. \frac{3x^2(x+1)}{5} - \frac{x^2(12x-1)}{30} = x^2 - \frac{3x-2}{30}$$

$$16. \frac{x^2(2x+1)}{4} - \frac{3(x+2)}{16} = \frac{x^2(3x+1)}{4} - x$$

$$17. \frac{x^2(x-1)}{5} - x^3 = \frac{8x-3}{5} - \frac{x^2(10x+29)}{20}$$

$$18. -2x - \frac{x^2(x+2)}{3} - \frac{x^2(4x+13)}{6} = 1 - \frac{x+4}{6}$$

$$19. 1 - \frac{x^2(2x+3)}{3} - \frac{x^2(2x-29)}{6} = 5x - \frac{5x}{6}$$

$$20. x - \frac{x^2(x-5)}{9} - \frac{10x-23}{27} = \frac{x(2x^2+3)}{9} + 1$$

$$21. x^3+x^2 - \frac{x^2(x+1)}{2} - \frac{x^2(4x+9)}{20} = \frac{5x+2}{20}$$

$$22. \frac{x(x^2-3)}{8} - \frac{9(3x+2)}{16} = x^2 - \frac{x^2(4x+11)}{16}$$

$$23. \frac{x^2(x-2)}{5} - 2x-1 = \frac{x^2(2x+3)}{4} - \frac{15x+14}{20}$$

$$24. \frac{2(2x+1)}{5} - \frac{x^2(5x-1)}{10} = 2x^2 + \frac{2x^2(x-1)}{5}$$

9. Resuelve la ecuación:

[Grado 3-C]

$$1. \frac{8-x}{18} + \frac{x^2(2x+1)}{9} = 1 - \frac{x^2(3x+2)}{18}$$

$$2. \frac{x^2(x+1)}{4} - \frac{x^2(x+1)}{5} - \frac{6x-5}{10} = -x+1$$

$$3. \frac{3x-5}{10} - \frac{x^2(x+1)}{5} = x - \frac{x^2(x-1)}{10}$$

$$4. x^3 - \frac{3x^3-2}{5} - \frac{17(x+1)}{10} = \frac{x^2(x+1)}{2}$$

$$5. x^2 + \frac{3}{4} - \frac{x(7x^2+5)}{8} = 4 - \frac{3x^2(x-1)}{4}$$

$$6. \frac{3x-26}{8} - \frac{x^2(x+1)}{2} = x - \frac{3x^2(x+2)}{8}$$

$$7. x - \frac{x(x^2+1)}{4} - \frac{5(x-1)}{6} = 3 - \frac{x^2(x+2)}{6}$$

$$8. x - \frac{9x}{10} - \frac{3x^2(x-1)}{5} = 1 - \frac{x^2(7x-6)}{10}$$

$$9. \frac{4x}{5} - \frac{x^2(7x-1)}{10} = 2x+1 - \frac{x(3x^2+2)}{5}$$

$$10. \frac{x^2+3}{8} - \frac{x(x^2+1)}{2} - x^2 = 2 - \frac{3x(x^2-5)}{8}$$

$$11. \frac{x^2(x-1)}{3} - \frac{5x+11}{12} = \frac{x^2(3x-11)}{12} - 2x-2$$

$$12. \frac{x^2(2x+3)}{2} - \frac{x^2(17x-9)}{16} - 2x^2 = \frac{3x+5}{16}$$

10. Resuelve la ecuación:

[Grado 4-A]

$$1. \frac{x^3(1-x)}{5} - \frac{x^2(x-5)}{10} = 1 - \frac{7-x}{10}$$

$$2. \frac{x^3(1-x)}{2} - 6 = x - \frac{x^2(x^2+17)}{6}$$

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

$$4. \frac{x^3(x+1)}{3} - \frac{x(x^2+1)}{6} = 1 - \frac{2x^2(2-x^2)}{3}$$

$$5. 8x - \frac{x^3(x-2)}{6} - \frac{x^3(x-22)}{12} = 3 + \frac{79x^2}{12}$$

$$6. \frac{2x^3(x+1)}{3} - \frac{x^3(5x-14)}{12} = 3-x - \frac{27x^2}{12}$$

$$7. \frac{11x^3-14}{15} - \frac{x(5x+1)}{30} = x^3-1 - \frac{x^3(x+3)}{10}$$

$$8. \frac{9x+16}{18} - \frac{x^3(x+1)}{2} - 1 = x - \frac{7x^2(2-x^2)}{18}$$

$$9. \frac{x^3(2x+3)}{4} - \frac{5x(x^3-2)}{12} - \frac{9x^3}{8} = 1 - \frac{x^2}{4}$$

$$10. 2-x - \frac{34x^3}{27} = \frac{7x^2(x^2+3)}{9} - \frac{x^3(2x+1)}{3}$$

$$11. \frac{11x}{2} - \frac{x^2(7-4x^2)}{3} = 2x^3+3 - \frac{x^3(3-2x)}{2}$$

$$12. \frac{x^3(x-1)}{8} - \frac{x^3(3x-2)}{12} - \frac{x-22}{24} = 1 - \frac{5x^2}{24}$$

$$13. x^2 - \frac{7x^3(x+1)}{6} - \frac{x^2(1-3x^2)}{2} = \frac{2(1-2x)}{3}$$

$$14. \frac{3}{4} + \frac{3x(x-4)}{16} = 1 - \frac{x^3(x+4)}{16} + \frac{x^3(x-1)}{4}$$

$$15. \frac{x^3(x+3)}{9} - \frac{5x^2(3-2x)}{27} = x^3 - \frac{4(8x+3)}{27}$$

$$16. \frac{x-1}{x} + \frac{7x^2}{18} - \frac{2x^3(x+1)}{9} = x - \frac{x^3(2x+9)}{18}$$

$$17. \frac{x^3(1-x)}{9} - \frac{5x^3+4}{6} = 2x^2+2x - \frac{x(5x+4)}{18}$$

$$18. \frac{x^2(3x^2-1)}{3} - \frac{x^2}{4} - \frac{5x(x^2-4)}{6} = 2x^2 - \frac{4}{3}$$

$$19. 2x^2 - \frac{3(5x+2)}{8} = \frac{x^3(x-1)}{8} - \frac{x^2(2x-19)}{24}$$

$$20. x^2 - \frac{3(x^3+2)}{4} - \frac{x(2x+3)}{12} = \frac{x^3(x-1)}{6} - 3x$$

$$21. x^3 + \frac{3(2x^2+9)}{5} - \frac{x(5x^2+63)}{10} = \frac{x^3(x-1)}{5}$$

$$22. \frac{13x}{2} - \frac{3x^3(x+1)}{4} = 3 + \frac{11x^2}{4} - \frac{x^3(9x+1)}{8}$$

$$23. \frac{3(7x^2-4)}{8} - \frac{x^3(2x-1)}{4} = x - \frac{x}{2} - \frac{x^3(x-4)}{8}$$

$$24. 1 - \frac{x^3(6x+1)}{24} = \frac{1}{2} - \frac{3x^3(x-1)}{8} - \frac{5x(4-x)}{24}$$

11. Resuelve la ecuación:

[Grado 4-B]

$$1. \frac{x^3}{3} - \frac{x^3(2x+1)}{2} = 1 - \frac{11x(2x+1)}{6}$$

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

$$3. \frac{3x^4+1}{10} - \frac{7(x^2+1)}{30} = \frac{2x(3x^2+4)}{15} - x^3$$

$$4. \frac{x^3(3x+1)}{12} - \frac{x^2(7x+9)}{24} = \frac{3x^4+1}{6} - x^2$$

$$5. \frac{x^2(1-7x)}{3} - \frac{x^3(2x+1)}{2} = 1-2x^4 - \frac{19x}{6}$$

$$6. \frac{x^3(3x+2)}{10} - \frac{11x(2x+1)}{20} = \frac{3x^3+14}{20} - 1$$



$$7. \frac{x^3(x+3)}{3} + \frac{x(5x^3-8)}{12} = 2x^2 - \frac{7x^2+4}{12}$$

$$8. \frac{x^3(x-1)}{6} - \frac{x^3(9x-34)}{18} - \frac{4}{9} = 3x^2 - 2x$$

$$9. 2x^2 - \frac{x^3(x+2)}{3} - \frac{7x^2-6}{9} = 1 - \frac{x(x^2+1)}{18}$$

$$10. \frac{3}{2} - \frac{2x^3(x-1)}{3} - \frac{23x^2}{6} = x - \frac{4x^3(x-1)}{3}$$

$$11. \frac{3x^3(x-1)}{2} - \frac{13x}{3} = x^4 + 2 - \frac{x^2(31x-18)}{12}$$

$$12. 1 - \frac{11x(2x+1)}{6} - \frac{x^3(x-2)}{2} = \frac{5x^3}{6} - \frac{3x^4}{2}$$

$$13. \frac{5x^3+3}{6} - x^3 - 1 = \frac{x^3(2x-1)}{6} - \frac{5x(3x+1)}{12}$$

$$14. \frac{4}{3} - \frac{x^3(2x-1)}{2} = x^3 - 2x - \frac{x^2(15x^2-38)}{6}$$

$$15. 2x - 1 - \frac{3x-2}{8} = \frac{x^3(2x+3)}{8} - \frac{x^2(4x+23)}{12}$$

$$16. \frac{3x-1}{3} + \frac{x^3(3x+2)}{4} - \frac{x^2(18x^2-7)}{12} = 2x^3$$

$$17. \frac{x^2(x^2+3)}{2} - \frac{x^2(5x-7)}{12} - \frac{x+1}{3} = x^2 - 2x^3$$

$$18. \frac{10x}{3} - \frac{x^3(2x-3)}{3} - \frac{x^3(2x+11)}{6} = 4 - 5x^2$$

$$19. \frac{x^3(x+2)}{2} - \frac{8x^2}{3} = \frac{17x}{2} - \frac{x^3(3x+13)}{6} - 3$$

$$20. \frac{x^3(2x+3)}{2} - \frac{5x^3-13x^2}{3} = 2x^4 - \frac{2(x-2)}{3}$$

$$21. 2x - \frac{x^3(2x-1)}{2} + \frac{2x^3(3x-5)}{9} = 2 - \frac{37x^2}{18}$$

$$22. \frac{3x^3(x+2)}{4} + \frac{14x}{3} + 1 = \frac{3x^3(x+1)}{2} - \frac{61x^2}{12}$$

$$23. \frac{x^3(x-2)}{4} - \frac{7x-1}{3} - \frac{11x^2}{6} = 1 - \frac{x^3(3x+13)}{12}$$

$$24. \frac{x^2(x^2+x)}{2} - \frac{x^3(11x+5)}{10} = -2x - \frac{2}{5} - \frac{13x^2}{10}$$

12. Resuelve la ecuación:

[Grado 4-C]

$$1. \frac{x^3(x-1)}{4} - \frac{x^3(x-2)}{8} = -5x - \frac{39}{8}$$

$$2. \frac{x^2(x^2-3)}{2} - \frac{x^2(7x^2-22)}{16} = \frac{15}{16} - x$$

$$3. \frac{x^3(x-2)}{4} - \frac{3x^3(x-2)}{8} = 2 - \frac{14x+1}{8}$$

$$4. \frac{2x^4+5}{10} - \frac{x^3(x-2)}{6} - \frac{2x(3x^2-4)}{15} = x$$

$$5. \frac{x^4}{2} - \frac{2x^3(x-1)}{3} - \frac{7x^3}{6} = \frac{5(x^2-2)}{3} + x$$

$$6. \frac{5x^4}{6} - \frac{x^3(3x-2)}{3} - \frac{39}{2} + 7x = \frac{x^2(x-1)}{3}$$

$$7. \frac{4x+1}{6} - \frac{x^3(3x-1)}{3} - 1 = x - \frac{x^2(7x^2+4)}{6}$$

$$8. \frac{x^3(x-1)}{2} - \frac{7x(2-2x^2)}{18} - x^4 = 1 - \frac{8x^4+3}{18}$$

$$9. \frac{4x^3(x+1)}{9} - \frac{41x}{18} - \frac{x^3(x+1)}{2} = 5 - \frac{x^2+12}{18}$$

$$10. -5 - x^3 - \frac{13x}{3} = \frac{x^3(3x-2)}{2} - \frac{x^2(10x^2+3)}{6}$$

$$11. x^3 - \frac{x^3(x+2)}{2} - \frac{x(x^2-2)}{9} = x - \frac{5(2x^4+3)}{18}$$

$$12. \frac{1}{2} - \frac{x^2(2x^2-3)}{5} = 1 - \frac{x(1-x)}{5} - \frac{x^3(5x-2)}{10}$$

13. Resuelve la ecuación:

[Grado 3-A]

$$1. \frac{8}{x} - \frac{45}{2x-1} = -6x+1$$

$$2. \frac{15}{x-1} - \frac{2}{x+1} = 2x+1$$

$$3. \frac{2}{3x} - \frac{20}{3x-9} = 3x+1$$

$$4. 1 - \frac{5}{x-2} - \frac{x-13}{x^2-4} = 2x$$

$$5. 4 + \frac{15}{x-1} - \frac{x+17}{x^2-1} = 3x$$

$$6. x - \frac{13}{2x} - \frac{2x-49}{4x^2+2x} = 1$$

$$7. 7 - \frac{16}{x} - \frac{x-45}{x^2+3x} = 2x$$

$$8. \frac{12}{2x-1} - \frac{x+21}{2x^2+x-1} = x$$

$$9. 9 - \left(2 - \frac{x^2+x-15}{x^2+2x+1} \right) = 3x$$

$$10. 2x - \frac{x-33}{9x^2-1} - \frac{11}{3x-1} = 5$$

$$11. 13 - \frac{1}{x-2} - \frac{7x-9}{x^2-x-2} = 3x$$

$$12. -2x - \frac{10}{x+2} - \frac{x+37}{x^2-x-6} = 1$$

$$13. \frac{1}{x+1} - \frac{17x+5}{x^2+2x+1} = -3x+2$$

$$14. 3x - \frac{1}{4} = 4 - \frac{4x^2-4x+15}{16x^2-4}$$

$$15. 5 - \frac{10}{x+1} - \frac{x-9}{3x^2+4x+1} = x$$

$$16. \frac{5}{x} - \frac{1}{x} \left(\frac{2}{3} - \frac{3x-31}{9x+3} \right) - x = 1$$

$$17. 1 - \frac{x-10}{3x^2-7x+2} + \frac{9}{3x-1} = x$$

$$18. \frac{5}{2x-2} - \frac{2x-1}{4x^2-10x+6} = x-1$$

$$19. -x - \frac{10}{x-3} - \frac{x-17}{3x^2-10x+3} = 5$$

$$20. \frac{10}{x+2} - \frac{x+12}{2x^2+7x+6} = 6x+5$$

$$21. \frac{1}{3} \left(\frac{x+43}{x+3} - 1 \right) - \frac{5}{6x+9} = -x+4$$

$$22. 2x - \frac{35}{3x+6} = 5 - \frac{1}{3} \left(\frac{x+7}{x-1} - 1 \right)$$

$$23. 1 - \frac{14}{3x-9} - \frac{1}{3} \left(\frac{x+28}{x+3} - 1 \right) = 2x$$

$$24. -2x - \frac{16}{9x+6} - \frac{3x+38}{27x^2-12} = 5$$

14. Resuelve la ecuación:

[Grado 3-B]

$$1. \frac{33-x}{x^2-x-6} - \frac{18}{x-3} = 4x$$

$$2. 17 - \frac{7}{x} - \frac{x+1}{x^2-x} = 6x$$

$$3. \frac{20}{3x+1} - \frac{x+7}{9x^2-1} = 4x$$

$$4. -9x - \frac{30}{x-2} - \frac{x-38}{x^2-4} = 6$$

$$5. \frac{16}{x+2} - \frac{x-6}{x^2+2x} = 6x+5$$

$$6. \frac{1}{x-1} - 4x = 8 - \frac{3}{x^2-2x+1}$$

$$7. 5 - \frac{21}{x+3} - \frac{x+18}{x^2+x-6} = 6x$$

$$8. 17 - \frac{10}{x+1} - \frac{x-17}{x^2-x-2} = 6x$$

$$9. \frac{1}{x-2} - \frac{24}{x^2-x-2} = -6x+13$$

$$10. 1 + \frac{14}{x+1} - \frac{x+27}{x^2+3x+2} = 6x$$

$$11. -6x - \frac{15}{x-1} - \frac{x-46}{x^2+2x-3} = 1$$

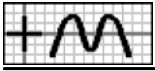
$$12. 33 - \frac{39}{x+2} - \frac{x-21}{x^2+x-2} = 9x$$

$$13. 19 - \frac{3}{3x+1} - \frac{x+18}{3x^2+x} = 6x$$

$$14. 6x - \frac{7}{x-1} = 13 - \frac{x-6}{x^2-3x+2}$$

$$15. 6x - \frac{7}{x-1} = 13 - \frac{x-6}{x^2-3x+2}$$

$$16. 23 - \frac{1}{x-1} - \frac{2(7x-3)}{x^2-1} = 6x$$



$$17. -2x - \frac{12}{x-3} - \frac{x+9}{3x^2-7x-6} = 5$$

$$18. -6x - \frac{5}{x+2} - \frac{x+21}{3x^2+4x-4} = 5$$

$$19. 3x - \frac{1}{3x-3} - \frac{25x-17}{3x^2-6x+3} = 4$$

$$20. \frac{2}{3x+2} - \frac{x-7}{3x^2+5x+2} = -2x+3$$

$$21. 1 - \frac{8}{2x+1} - \frac{x-27}{2x^2+7x+3} = 3x$$

$$22. 5 - \frac{17}{x+3} - \frac{1}{x+3} \left(2 - \frac{x}{x+1} \right) = 6x$$

$$23. \frac{11}{x+1} - \frac{1}{x+1} \left(2 - \frac{x+14}{x-1} \right) = 6x+7$$

$$24. \frac{11}{3x+3} - \frac{3x-34}{9x^2+12x+3} = 2x+3$$

15. Resuelve la ecuación:

[Grado 3-C]

$$1. \frac{1}{x-1} - \frac{x+17}{x^2-1} - x = 1$$

$$2. 3 - \frac{4}{x} - \frac{x-7}{x^2-2x} = x$$

$$3. 3 - \frac{12}{x-2} - \frac{x-23}{x^2-4} = x$$

$$4. 5 - \frac{18}{2x-3} - \frac{x-47}{4x^2-9} = x$$

$$5. 1 - \frac{8}{x-1} - \frac{x-38}{x^2+x-2} = x$$

$$6. 4 - \frac{18}{x+2} - \frac{x+17}{x^2-x-6} = x$$

$$7. \frac{x+7}{x^2-5x+6} + \frac{10}{x-3} + x = 0$$

$$8. \frac{5-x}{x^2+2x-3} - \frac{11}{x-1} - 5 = x$$

$$9. -x - \frac{x+7}{x^2+3x+2} - \frac{10}{x+1} = 6$$

$$10. \frac{21-x}{3x^2+x-2} - \frac{10}{x+1} - 3x = 2$$

$$11. \frac{1}{x+1} + \frac{1}{x+1} \left(x - \frac{x-17}{x-1} \right) - x = 1$$

$$12. 2 - \frac{12}{x+2} - \frac{1}{x+3} \left(2 - \frac{x+41}{x+2} \right) = x$$

16. Resuelve la ecuación:

[Grado 3-Falsas]

$$1. 3 - \frac{4}{x-2} - \frac{x-18}{x^2-4} = 2x$$

$$2. \frac{7}{3x-1} - \frac{x+2}{3x^2-x} = x+1$$

$$3. 7 - \frac{x-12}{x^2-2x} - \frac{5}{x-2} = 2x$$

$$4. \frac{x-47}{x^2+x-6} + \frac{9}{x-2} = -3x+4$$

$$5. x - \frac{11}{2x-3} = 2 - \frac{x+37}{2x^2+x-6}$$

$$6. \frac{x-18}{9x^2+6x} - \frac{28}{9x+6} + x = 2$$

$$7. 4 - \frac{17}{3x+2} - \frac{x-5}{3x^2+5x+2} = x$$

$$8. -x - \frac{7}{2x-1} - \frac{x+10}{2x^2-5x+2} = 3$$

$$9. \frac{4}{x+1} - \frac{1}{x+1} \left(2 - \frac{x+5}{x-1} \right) = 2x+3$$

$$10. \frac{4}{9x-6} - \frac{3x+14}{27x^2-12} = x$$

$$11. 5 - \frac{x-33}{x^2-x-6} - \frac{6}{x-3} = 6x$$

$$12. 2 - \frac{11}{9x-3} - \frac{3x-23}{27x^2-3} = x$$

$$13. 6x - \frac{3}{x+1} = 1 - \frac{1}{x} \left(2 - \frac{x+4}{x+1} \right)$$

$$14. 3x - \frac{7}{2x+3} - \frac{9-x}{2x^2+3x} = 8$$

$$15. \frac{2}{x+3} + \frac{x+5}{x^2+5x+6} + 4x = 0$$

$$16. \frac{13}{9x-6} - \frac{3x+50}{27x^2-12} - 6x = 11$$

$$17. -3x - \frac{29}{3x+1} - \frac{x+39}{3x^2-2x-1} = 8$$

$$18. 9 - \frac{23}{2x+3} - \frac{x+13}{2x^2+5x+3} = 2x$$

$$19. 7 - \frac{19}{x-1} - \frac{x-39}{x^2-1} = x$$

$$20. \frac{x+28}{x^2-x-2} + \frac{9}{x+1} + x = 0$$

$$21. 2 - x - \frac{4}{x-3} - \frac{x-15}{x^2-3x} = 0$$

$$22. 1 - \frac{3}{x+3} - \frac{x+15}{x^2+2x-3} = x$$

$$23. \frac{7-x}{x^2+3x+2} - \frac{8}{x+1} = x+2$$

$$24. 1 - \frac{3}{x+1} - \frac{1}{x+1} \left(2 - \frac{x-9}{x-1} \right) = x$$

17. Resuelve la ecuación:

[Grado 4-A]

$$1. x^2 - \frac{30}{7x+21} - 1 = \frac{45}{14x-7}$$

$$2. \frac{9}{x} - \frac{10}{x-2} + 3x^2+x = 23$$

$$3. x^2 - \frac{1}{2} = 6 - \frac{2x^2+9x+36}{4x^2+6x}$$

$$4. \frac{12}{x+1} - \frac{20}{x-1} + x+22 = 2x^2$$

$$5. 3 - \frac{8}{3x} - \frac{5}{6x-9} = 2x^2-4x$$

$$6. \frac{3}{x+2} - \frac{x+11}{2x^2+x-6} = 2x^2+3$$

$$7. \frac{4}{x-1} - \frac{24}{x-3} - 3x^2-8x = 0$$

$$8. \frac{16}{x+2} - \frac{x-17}{x^2-4} - 2x^2+5x = 3$$

$$9. 22 - \frac{18}{x+1} - \frac{8}{x-1} = 3x^2-2x$$

$$10. 11 - \frac{14}{x+1} - \frac{x+11}{x^2-1} = 3x^2-5x$$

$$11. 2x^2-3x - \frac{10}{x+2} = 3 - \frac{x-23}{x^2-4}$$

$$12. \frac{x+11}{2x^2-3x-2} - \frac{5}{x-2} + x^2 = 6$$

$$13. \frac{x-12}{2x^2+3x} - \frac{2}{x} + 2x^2-17 = 0$$

$$14. 9 + \frac{8}{x-1} - \frac{x+15}{2x^2+x-3} = x^2+x$$

$$15. \frac{19}{x} - \frac{x+17}{2x^2-x} - 6x+7 = 2x^2$$

$$16. \frac{x+14}{2x^2+3x+1} + 2x^2 = 7 - \frac{5}{x+1}$$

$$17. \frac{13}{x+2} - \frac{x+13}{x^2-4} - 3x^2+4x = 10$$

$$18. 10-3x^2 - \frac{x+3}{x^2+2x} = 6 - \frac{17}{x+2}$$

$$19. \frac{23}{x} - \frac{x-5}{x^2-x} - 2x^2+15x = 35$$

$$20. 13 - \frac{x-48}{2x^2+x-6} + \frac{6}{2x-3} = 2x^2$$

$$21. 3 - \frac{19}{x-3} - \frac{x-44}{x^2-2x-3} = 3x^2-2x$$

$$22. \frac{3-2x}{2x-1} - \frac{x+18}{2x^2+3x-2} = x^2-3x$$

$$23. 3x + \frac{2}{x+2} - \frac{x+7}{2x^2+3x-2} = x^2$$

$$24. \frac{11-x}{x^2-2x-3} - \frac{27}{x-3} - 3x^2-4x = 4$$

18. Resuelve la ecuación:

[Grado 4-B]

$$1. 19 - \frac{18}{x-1} - \frac{x-19}{x^2-1} = 4x^2-8x$$

$$2. 4x^2-8x - \frac{21}{x-2} = 1 - \frac{x+47}{x^2-4}$$

$$3. x+20 - \frac{2}{x+1} - \frac{x-10}{x^2-1} = 6x^2$$

$$4. \frac{22}{x+2} - \frac{x+19}{x^2-4} = 6x^2-7x+15$$

$$5. \frac{10}{x+1} - \frac{9}{x-1} - 7x+6x^2 = 31$$

$$6. \frac{15}{2x-4} + \frac{3}{2x} - 6x^2+17x = 5$$

$$7. x - \frac{8}{x-2} - 6x^2 - \frac{x+9}{x^2-x-2} = 8$$

$$8. \frac{10}{x} - \frac{x+23}{x^2+2x} - 6x^2+5x = 1$$



9. $6 + \frac{8}{x} - \frac{x-22}{x^2-2x} = 6x^2-13x$ 10. $4x^2 - \frac{28}{x-1} = 15 - \frac{x-17}{x^2-3x+2}$ 11. $10 - \frac{7}{x} - \frac{x+5}{3x^2+x} = 6x^2-9x$ 12. $\frac{10}{x-1} - \frac{x+31}{x^2-1} - 6x^2-23x = 9$

13. $\frac{9}{2x} - \frac{25}{6x+4} + 3x = -6x^2+11$ 14. $33 - \frac{1}{x+1} - \frac{x-6}{x^2+x} = 6x^2-7x$ 15. $\frac{36}{x-1} - \frac{x+27}{x^2-x} - 6x^2+41x = 82$ 16. $\frac{31}{x+2} - \frac{x-17}{x^2-4} - 4x^2+12x = 9$

17. $x - \frac{5}{2x-2} - \frac{x-35}{2x^2-2} = 6x^2-19$ 18. $25 - \frac{27}{x+2} - \frac{x-17}{x^2+x-2} = 6x^2-x$ 19. $\frac{3}{x-1} - \frac{x+6}{x^2-x} - 6x^2+29x = 33$ 20. $1 - \frac{26}{x-3} - \frac{x-17}{x^2-2x-3} = 6x^2-x$

21. $18 - \frac{10}{x-1} - \frac{x-47}{x^2+x-2} = 6x^2+7x$ 22. $5x+7 - \frac{20}{2x-1} - \frac{x-12}{2x^2-x} = 3x^2$ 23. $\frac{7}{2x-2} - \frac{x-17}{2x^2-2} - 6x^2+20 = x$ 24. $-\frac{39}{x-3} - \frac{x+6}{x^2-3x} - 4x^2-8x = 11$

19. Resuelve la ecuación:

[Grado 4-C]

1. $\frac{15}{x} + \frac{25}{x+2} - x^2+2x = 7$ 2. $\frac{45}{2x+4} - \frac{5}{2x} - x^2+2x = 6$ 3. $\frac{7}{x-1} - \frac{x-26}{x^2-1} - x^2-2x = 7$ 4. $\frac{16}{x+1} - 3x+2 = \frac{12}{x-1} - x^2$

5. $4x - x^2 - \frac{3}{x+2} - \frac{x+43}{x^2-4} = 6$ 6. $\frac{24}{x+3} - \frac{x-5}{x^2+3x} - x^2+x = 7$ 7. $\frac{7}{x-2} - \frac{x+41}{x^2-4} - x^2+2x = 8$ 8. $-x^2-2x - \frac{19}{x} - \frac{x+23}{x^2-2x} = 2$

9. $x + \frac{25}{2x-2} - \frac{x+40}{2x^2-2x} = x^2$ 10. $x^2+14 - \frac{13}{x+3} = 2x - \frac{x+38}{x^2+x-6}$ 11. $3x - \frac{44}{3x-9} - \frac{x-39}{3x^2-9x} = x^2+3$ 12. $\frac{13}{x} + \frac{1}{x} \left(2 - \frac{x-15}{x+1} \right) + x^2+2x = 1$

20. Resuelve la ecuación:

[Grado 4-Falsas]

1. $x - \frac{x+14}{x^2-4} + \frac{4}{x-2} = 2x^2$ 2. $5 - \frac{15}{2x-1} - \frac{x-23}{2x^2+x-1} = x^2$ 3. $3x - 2x^2 - \frac{5}{x+3} - \frac{x+33}{x^2-9} = 4$ 4. $4 - \frac{35}{3x+1} - \frac{x+12}{3x^2+x} = x^2-3x$

5. $16x - 3x^2 - \frac{7}{x+1} - \frac{x+15}{x^2-1} = 17$ 6. $\frac{13}{x-1} - \frac{x+38}{x^2+x-2} - 3x^2+4x = 5$ 7. $6 - 3x^2 - \frac{1}{x-2} - \frac{x-5}{x^2-x-2} = 2x$ 8. $\frac{4}{x+1} - \frac{x+5}{x^2+3x+2} - x-2 = 2x^2$

9. $\frac{17}{2x-3} - \frac{x+24}{2x^2-3x} - x^2+4 = 2x$ 10. $7 + \frac{4}{x-3} - \frac{x+9}{x^2-3x} = 4x^2$ 11. $-5x - \frac{1}{x+1} - \frac{x+3}{x^2-1} = 6x^2$ 12. $3 + \frac{10}{x+1} - \frac{x-19}{x^2-1} = 4x^2+8x$

13. $\frac{13}{x-1} - \frac{x+12}{x^2-x} - 17x-4 = 6x^2$ 14. $\frac{4}{x+2} - \frac{x-14}{x^2-4} - 3+12x = 4x^2$ 15. $6x^2-x - \frac{3}{x+2} = 8 - \frac{x-7}{x^2+x-2}$ 16. $13x - 6x^2 - \frac{2}{x-2} - \frac{x-6}{x^2-2x} = 4$

17. $5 - \frac{x+6}{3x^2-x} = 2x^2+3x - \frac{19}{3x-1}$ 18. $3 + \frac{7}{x-2} - \frac{x+19}{x^2-x-2} = 4x^2+12x$ 19. $5x - \frac{4}{x+2} - x^2 - \frac{x+18}{x^2-4} = 9$ 20. $\frac{9}{x+1} - \frac{x-17}{x^2-1} - x^2+7x = 18$

21. $\frac{6}{x-1} - \frac{x+17}{x^2+x-2} - x^2-5x = 9$ 22. $\frac{14}{x+3} - \frac{x-39}{x^2+3x} - x^2+7x = 19$ 23. $1 - \frac{44}{3x-3} - \frac{x-45}{3x^2-3x} = x^2+x$ 24. $\frac{30}{x-1} - \frac{x-31}{x^2-3x+2} - x^2-5x = 5$

-Soluciones-

1.1. $-2, \frac{-3}{2}, 2$ 1.2. $-1, \frac{1}{2}, 3$ 1.3. $\frac{-1}{3}, 1, 2$ 1.4. $-3, \frac{1}{3}, 2$ 1.5. $\frac{3}{2}, 2, 3$ 1.6. $\frac{-1}{3}, 1, 3$ 1.7. $-1, \frac{2}{3}, 1$ 1.8. $-3, \frac{3}{2}, 2$ 1.9. $-2, \frac{1}{3}$ 1.10. $-2, \frac{2}{3}, 2$ 1.11. $-3, \frac{1}{3}, 3$ 1.12. $-\frac{2}{3}, 2, 3$ 1.13. $-2, \frac{-1}{2}, 1$ 1.14. $-1, \frac{-1}{2}, 3$ 1.15. $-1, \frac{2}{3}, 3$ 1.16. $-3, -1, \frac{1}{2}$ 1.17. $\frac{-1}{2}, 2, 3$ 1.18. $-3, -2, \frac{-1}{3}$ 1.19. $-3, \frac{-3}{2}, -1$ 1.20. $-3, \frac{1}{2}, 1$ 1.21. $-2, \frac{3}{2}, 2$ 1.22. $-3, \frac{2}{3}, 3$ 1.23. $-3, \frac{-1}{2}, 3$ 1.24. $\frac{-3}{2}, 1, 3$ 2.1. $\frac{-2}{3}, \frac{1}{3}, 1$ 2.2. $\frac{-3}{2}, \frac{2}{3}, 1$ 2.3. $\frac{-1}{2}, \frac{1}{3}, 1$ 2.4. $\frac{-3}{2}, \frac{1}{2}, 2$ 2.5. $-1, \frac{-1}{2}, \frac{3}{2}$ 2.6. $\frac{-3}{2}, \frac{-2}{3}, 1$ 2.7. $\frac{-1}{2}, \frac{2}{3}, 2$ 2.8. $\frac{-1}{2}, \frac{2}{3}, 1$ 2.9. $-1, \frac{2}{3}, \frac{3}{2}$ 2.10. $-2, \frac{1}{3}, \frac{3}{2}$ 2.11. $-2, \frac{1}{2}, \frac{2}{3}$ 2.12. $-2, \frac{-2}{3}, \frac{-1}{3}$ 2.13. $\frac{-1}{3}, \frac{1}{2}, 1$ 2.14. $-1, \frac{1}{3}, \frac{1}{2}$ 2.15. $-2, \frac{-1}{3}, \frac{3}{2}$ 2.16. $-2, \frac{-3}{2}, \frac{-2}{3}$ 2.17. $-1, \frac{-2}{3}, \frac{1}{3}$ 2.18. $\frac{-3}{2}, \frac{1}{3}, 2$ 2.19. $-1, \frac{-1}{3}, \frac{3}{2}$ 2.20. $\frac{-3}{2}, \frac{2}{3}, 3$ 2.21. $\frac{-2}{3}, \frac{1}{2}, 3$ 2.22. $\frac{-3}{2}, \frac{1}{2}, 3$ 2.23. $\frac{-1}{2}, \frac{-1}{3}, 3$ 2.24. $\frac{-3}{2}, \frac{1}{3}, 2$ 3.1. -3 3.2. -1 3.3. -3 3.4. 1 3.5. 1 3.6. 3 3.7. 2 3.8. -2 3.9. 3 3.10. 1 3.11. -3 3.12. 2 4.1. $-2, \frac{1}{3}, 1$ 4.2. $-3, -1, \frac{-1}{3}, 1$ 4.3. $-3, \frac{-3}{2}, 3$ 4.4. $-2, -1, \frac{3}{2}, 3$ 4.5. $-3, -2, \frac{1}{2}, 1$ 4.6. $-2, -1, \frac{-1}{2}, 1$ 4.7. $-1, \frac{-1}{3}, 3$ 4.8. $-2, -1, \frac{1}{3}, 1$ 4.9. $-1, \frac{3}{2}, 2$ 4.10. $-3, -1, \frac{-2}{3}, 1$ 4.11. $-3, -1, \frac{1}{3}, 1$ 4.12. $-3, \frac{-1}{2}, 1, 3$ 4.13. $-2, \frac{-3}{2}, 1, 3$ 4.14. $-2, \frac{1}{2}, 1$ 4.15. $-3, -2, \frac{-1}{3}, 1$ 4.16. $\frac{1}{3}, 1, 3$ 4.17. $1, \frac{3}{2}, 2, 3$ 4.18. $-3, -1, \frac{1}{2}, 2$ 4.19. $-2, -1, \frac{3}{2}, 2$ 4.20. $-2, -1, \frac{1}{2}, 2$ 4.21. $-2, \frac{-1}{3}, 1, 3$ 4.22. $-3, -2, -1, \frac{1}{2}$ 4.23. $-2, \frac{2}{3}, 2, 3$ 4.24. $\frac{-3}{2}, -1, 2, 3$ 5.1. $-1, \frac{1}{3}, \frac{1}{2}$ 5.2. $-1, \frac{1}{2}, \frac{3}{2}$ 5.3. $-2, \frac{-3}{2}, \frac{2}{3}, 1$ 5.4. $-2, \frac{-1}{2}, \frac{1}{3}, 1$ 5.5. $-1, \frac{-1}{2}, 1, \frac{3}{2}$ 5.6. $-3, \frac{-1}{3}, 1, \frac{3}{2}$ 5.7. $\frac{-3}{2}, \frac{-1}{3}, 1, 2$ 5.8. $\frac{-3}{2}, -1, \frac{-1}{3}, 3$ 5.9. $-2, \frac{-1}{3}, \frac{1}{2}, 1$ 5.10. $-2, \frac{-2}{3}, \frac{3}{2}$ 5.11. $-1, \frac{1}{2}, \frac{2}{3}, 3$ 5.12. $\frac{-2}{3}, \frac{3}{2}, 2, 3$ 5.13. $\frac{1}{2}, \frac{2}{3}, 1, 3$ 5.14. $-3, \frac{-2}{3}, \frac{1}{2}, 3$ 5.15. $-2, \frac{-2}{3}, \frac{-1}{3}, 1$ 5.16. $-3, -1, \frac{-2}{3}, \frac{3}{2}$ 5.17. $\frac{-2}{3}, \frac{1}{3}, 1$ 5.18. $-3, \frac{-3}{2}, \frac{-1}{2}, 1$ 5.19. $-2, \frac{1}{3}, \frac{2}{3}, 3$ 5.20. $\frac{-2}{3}, 1, \frac{3}{2}$ 5.21. $-2, \frac{-1}{2}, \frac{3}{2}, 2$ 5.22. $\frac{-3}{2}, \frac{1}{3}, 1$ 5.23. $-3, -2, \frac{-1}{2}, \frac{1}{3}$ 5.24. $-2, \frac{1}{2}, \frac{2}{3}, 1$ 6.1. $-1, 1$ 6.2. $-2, -1$ 6.3. $-1, 2$ 6.4. $-2, 3$ 6.5. $-2, -1$ 6.6. $-1, 2$ 6.7. $-3, -2$ 6.8. $-2, 3$ 6.9. $-2, 1$ 6.10.



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\frac{3}{2}$ 20.17. $-2, -1, \frac{3}{2}$ 20.18. $-3, \frac{3}{2}, \frac{1}{2}$ 20.19. 1 20.20. 2 20.21. -1 20.22. 1 20.23. -3 20.24. 3