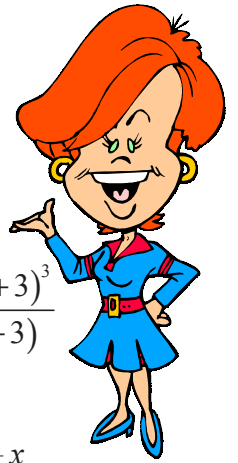




Simplifying Algebraic Fractions.



A. Cancel down the following.

1. $\frac{12x}{4}$

2. $\frac{6}{8x}$

3. $\frac{2x^2}{24x}$

4. $\frac{xy^2}{yx^2}$

5. $\frac{18}{27x}$

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

7. $\frac{x+1}{4(x+1)}$

8. $\frac{10x}{5(x-2)}$

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

10. $\frac{4(x+3)^3}{(x+3)}$

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

12. $\frac{\frac{1}{3}+x}{\frac{2}{3}}$

13. $\frac{2x+\frac{1}{4}}{\frac{1}{4}}$

14. $\frac{x+\frac{1}{x}}{\frac{1}{x}}$

15. $\frac{\frac{2}{3}+\frac{1}{2}x}{\frac{1}{4}}$

16. $\frac{(x+2)(x+1)}{x(x+2)}$

17. $\frac{(x+5)(x+6)}{(x+5)^2}$

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

19. $\frac{8x^3(x+2y)^2(x-2y)}{2x(x-2y)^2(x+2y)}$

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

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

B. Factorize and cancel down the following.

1. $\frac{2x+4}{2}$

2. $\frac{8}{6x-4}$

3. $\frac{10x}{5x-20}$

4. $\frac{9x-3}{18x+3}$

5. $\frac{2-4x}{6x+8}$

6. $\frac{3x+6}{4x+8}$

7. $\frac{x-1}{10x-10}$

8. $\frac{x-1}{1-x}$

9. $\frac{6x-12}{x-2}$

10. $\frac{6x-12}{2-x}$

11. $\frac{5-x}{x-5}$

12. $\frac{2x-x^2}{x}$

13. $\frac{2x-x^2}{2-x}$

14. $\frac{6x}{3x-9}$

15. $\frac{15-3x}{4x-20}$

C. Factorize then cancel down the following.

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

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

3. $\frac{x^2+9x+20}{x+4}$

4. $\frac{x-4}{x^2-9x+20}$

5. $\frac{x-2}{x^2-11x+18}$

6. $\frac{x^2-17x+60}{5-x}$

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

8. $\frac{10+2x}{x^2+x-20}$

9. $\frac{x^2-3x-18}{3x+9}$

10. $\frac{16+2x}{x^2+13x+40}$

11. $\frac{x+x^2}{x+1}$

12. $\frac{x^2+7x+6}{2x+2}$

13. $\frac{10-10x}{x^2+7x-8}$

14. $\frac{x^2+11x+30}{x^2+7x+6}$

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

16. $\frac{x^2-48x-49}{x^2-1}$

17. $\frac{x^2+x-12}{x^2+7x-30}$

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

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

20. $\frac{x^2-1}{1-x^2}$

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

22. $\frac{3x^2+4x-4}{3x^2+10x+8}$

23. $\frac{3x^2-4x-15}{5x^2-9x-18}$

24. $\frac{5x^2+8x-4}{5x^2-4x-28}$

25. $\frac{5x^2+x-6}{5x^2-9x-18}$

26. $\frac{ad+ac+bc+bd}{pc+pd+qc+qd}$

27. $\frac{a^2-ab}{(a-b)^2}$

28. $\frac{x^2-xy-xz+zy}{xp-yp+qx-qy}$

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

30. $\frac{(2a-b)^2-(a-2b)^2}{a^2-b^2}$

31. $\frac{x^2+xy-2y^2}{x^2+3xy+2y^2}$

32. $\frac{x^2-2xy+3y^2}{x^2-xy-2y^2}$

33. $\frac{x^2-xy-2y^2}{x^2-3xy+2y^2}$

34. $\frac{x^2+2xy+x+y}{x^2+xy+x+y}$

35. $\frac{x^2+2x-2y-xy}{xy-3y+3x-x^2}$

36. $\frac{x^2+2xy+y^2-1}{x+y+1}$



D Multiply, factorize and cancel down the following.

1. $\frac{12ab}{25ca^2} \times \frac{5dc}{6b^2}$

2. $\frac{48a^3b}{2ca} \times \frac{3dc^2}{18d^3}$

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

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

5. $\frac{a+b}{3ab} \times \frac{6a^2}{2a+2b}$

6. $\frac{x^2y}{2x-y} \times \frac{6x-3y}{y^2x}$

7. $\frac{a-2b}{a+b} \times \frac{a^2+2ab+b^2}{6b-3a}$

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

9. $\frac{x^2-6x-7}{x^2-4} \times \frac{x^2-x-2}{x^2-7x}$

10. $\frac{4+3x-x^2}{x^2+2x+1} \times \frac{2x^2+5x+3}{48-3x^2}$

11. $\frac{ac+bc-ad-bd}{a^2+2ab+b^2} \times \frac{c+d}{c^2-d^2}$

12. $\frac{ac+2bc+2bd+ad}{a^2+2ab+b^2-1} \times \frac{a+b+1}{a+2b}$

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

14. $\frac{x^2-x-20}{x^2+7x} \times \frac{3x^2+21x}{x^2-25}$

15. $\frac{x^2-16}{x^2-x-12} \times \frac{x^2+3x}{x^2}$

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

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

18. $\frac{a^2+ab-2b^2}{a^2+3ab+2b^2} \times \frac{a^2-2ab}{a^2-ab}$

19. $\frac{p^2-5pq+6q^2}{p^2+2pq-3q^2} \times \frac{p^2-q^2}{p^2-2pq-3q^2}$

20. $\frac{ac+bc+ad+bd}{ac-bc+bd-ad} \times \frac{ac-bc+ad-bd}{c^2+2cd+d^2}$



E Divide, factorize and cancel down the following.

1. $\frac{15abc}{7a^3bc^2} \div \frac{15a^3bc^2}{21(abc)^2}$

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

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

4. $\frac{20x^2}{3(x-1)} \div \frac{4x}{15(x-1)}$

5. $\frac{2x+4y}{x-y} \div \frac{2y+4x}{y-x}$

6. $\frac{pq}{2p-6q} \div \frac{p^2q}{3p-9q}$

7. $\frac{x^2-4}{x^2+3x+2} \div \frac{x}{x+1}$

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

9. $\frac{1}{x^2+3x+2} \div \frac{1}{x^2-1}$

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

11. $\frac{1}{2x^2+3x-2} \div \frac{1}{6x^2-5x+1}$

12. $\frac{x}{x^2+2x} \div \frac{x+1}{4x^2+9x+2}$

13. $\frac{ac+bc+bd+ad}{c^2-d^2} \div \frac{ac+bc-ad-bd}{c^2-2cd+d^2}$

14. $\frac{xyz^2-xy^2z}{x^2+2xy+y^2+zx+zy} \div \frac{xyz}{x+y+z}$

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

16. $\frac{6x^2+5x+1}{15x^2+4x-4} \div \frac{6x^2+5x+1}{12x^2+5x-2}$

17. $\frac{x^2+2xy-3y^2}{x^2-xy-2y^2} \times \frac{x^2-y^2}{xy+3y^2} \div \frac{x^2-2xy+y^2}{x^2-2xy}$

18. $\frac{x^2-3xy-4y^2}{x^2+xy-2y^2} \div \frac{x^2-xy-2y^2}{x^2-3xy+2y^2} \times \frac{x^2+2xy}{x^2-xy}$

19. $\frac{x^2-xy-6y^2}{x^2-3xy+2y^2} \div \left[\frac{x^2+xy+x+2y}{x^2-2xy} \times \frac{x^2+2xy}{x^2-xy+x-y} \right]$



Combining Algebraic Fractions.



A Make the following into a single fraction.

- | | | | | |
|--|--------------------------------------|---------------------------------------|---|---|
| 1. $1 + \frac{1}{x}$ | 2. $3 - \frac{3}{x}$ | 3. $2 + \frac{5}{x}$ | 4. $\frac{5}{2x} - 8$ | 5. $\frac{2}{x} + \frac{5}{x}$ |
| 6. $\frac{2}{x} + \frac{6}{2x}$ | 7. $\frac{3}{2x} + \frac{2}{3x}$ | 8. $\frac{5}{2x} + \frac{1}{x}$ | 9. $\frac{4}{5y} - \frac{2}{y}$ | 10. $\frac{p}{q} + \frac{q}{p}$ |
| 11. $\frac{p}{3q} - \frac{2q}{p}$ | 12. $1 + \frac{2}{x} + \frac{3}{2x}$ | 13. $1 + \frac{1}{x} + \frac{1}{x^2}$ | 14. $a + \frac{a}{b} + \frac{a}{b^2}$ | 15. $2 - \frac{y}{x} + \frac{x}{y}$ |
| 16. $\frac{1}{ab} + \frac{1}{bc} + \frac{1}{ac}$ | 17. $\frac{1+x}{x} + \frac{1+y}{y}$ | 18. $1 + \frac{a+b}{a} + \frac{a}{b}$ | 19. $\frac{p-q}{2pq} + \frac{p+q}{3pq}$ | 20. $\frac{p}{q} + \frac{q}{r} + \frac{r}{p}$ |



B Make the following into a single fraction.

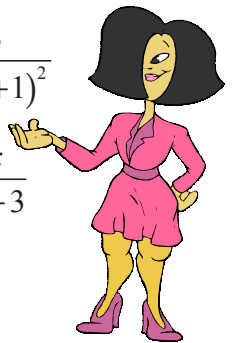
- | | | | | |
|----------------------------|--------------------------|---------------------------|------------------------------|------------------------------|
| 1. $2 + \frac{1}{x-1}$ | 2. $\frac{1}{x+1} + 3$ | 3. $3 - \frac{2}{1-x}$ | 4. $2 + \frac{3}{5x-1}$ | 5. $x + \frac{1}{x}$ |
| 6. $\frac{2}{1-x} - 1$ | 7. $2x + \frac{1}{x+1}$ | 8. $4x + \frac{1}{x-2}$ | 9. $\frac{1}{x-3} - x$ | 10. $\frac{3x}{x-5} + x$ |
| 11. $\frac{3x+1}{x-1} - x$ | 12. $\frac{3}{5-2x} - 2$ | 13. $2 + x + \frac{1}{x}$ | 14. $2 - 3x - \frac{1}{x+1}$ | 15. $x - 7 - \frac{x}{1-3x}$ |

C Make the following into a single fraction.

- | | | | | |
|-------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|---|
| 1. $\frac{1}{x+1} + \frac{1}{x-1}$ | 2. $\frac{1}{x+2} + \frac{1}{x-2}$ | 3. $\frac{1}{x} + \frac{1}{x-1}$ | 4. $\frac{2}{x-2} + \frac{3}{x+3}$ | 5. $\frac{4}{x-1} - \frac{4}{x+2}$ |
| 6. $\frac{3}{x-1} - \frac{1}{x}$ | 7. $\frac{2}{x-3} + \frac{1}{x+1}$ | 8. $\frac{1}{x+2} + \frac{3}{2x+4}$ | 9. $\frac{1}{x-y} + \frac{1}{x+y}$ | 10. $\frac{3}{x-y} + \frac{2}{y-x}$ |
| 11. $\frac{x}{x-y} - \frac{y}{y-x}$ | 12. $\frac{x}{x-3} + \frac{x}{x+3}$ | 13. $\frac{x+1}{x-1} - \frac{x}{x+1}$ | 14. $\frac{x+1}{x+2} - \frac{x-1}{x}$ | 15. $\frac{x+2}{x+1} - \frac{x-2}{x-1}$ |

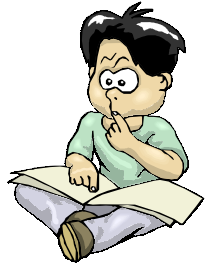
D Make the following into a single fraction.

- | | | | |
|--|---|--|---|
| 1. $\frac{1}{x} - \frac{1}{x^2}$ | 2. $\frac{2}{x-1} + \frac{1}{(x-1)^2}$ | 3. $\frac{3}{x+1} + \frac{4}{(x+1)^2}$ | 4. $\frac{2}{2x+1} + \frac{3}{(2x+1)^2}$ |
| 5. $\frac{1}{x-1} - \frac{1}{(x-1)^2}$ | 6. $\frac{x}{x+1} - \frac{1}{(x+1)^2}$ | 7. $\frac{1-2x}{(x+2)^2} + \frac{x}{x+2}$ | 8. $\frac{3x+2}{(x+3)^2} + \frac{x}{x+3}$ |
| 9. $\frac{x}{x-2} + \frac{x}{(x-2)^2}$ | 10. $1 + \frac{1}{x-1} + \frac{1}{(x-1)^2}$ | 11. $\frac{1}{x^2+x} + \frac{1}{x^2-x}$ | |
| 12. $\frac{1}{(x-1)(x+2)} - \frac{1}{(x+1)(x+2)}$ | 13. $\frac{3}{(x+1)(x-2)} - \frac{2}{(x-1)(x-2)}$ | 14. $\frac{x+1}{(x+2)(x-2)} - \frac{x}{(x+2)(x-1)}$ | |
| 15. $\frac{1}{x^2+3x+2} + \frac{1}{x^2+4x+3}$ | 16. $\frac{2}{2x^2+5x-3} - \frac{3}{3x^2+11x+6}$ | 17. $\frac{2x}{x^2-1} + \frac{1}{x-1} - \frac{1}{x+1}$ | |
| 18. $\frac{7}{x^2+3x+2} + \frac{7}{x+2} + \frac{7}{x+1}$ | 19. $\frac{x^{-1}}{1-x} - \frac{x-1}{1-x^{-1}}$ | 20. $\frac{1}{ab-ac+b^2-bc} - \frac{1}{ab+ac+b^2+bc}$ | |
| 21. $\frac{2}{x^2+4x+3} + \frac{1}{x^2+3x+2} - \frac{3}{x^2+5x+6}$ | 22. $\frac{10y-6x}{6y^2-5xy+x^2} + \frac{2}{2y-x} - \frac{4}{3y-x}$ | | |





Equations involving Algebraic Fractions.



Solve the following equations.

A

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

2. $\frac{3}{x} = 4$

3. $\frac{x+2}{5} = 1$

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

5. $\frac{6}{x} = \frac{5}{x-1}$

6. $\frac{3}{x+1} = -1$

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

8. $\frac{x}{3} = \frac{x+1}{4}$

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

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

11. $\frac{8}{3x} = 5$

12. $\frac{2x}{x+5} = 3$

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

14. $\frac{x-4}{x+8} = \frac{x}{2}$

15. $x = \frac{3}{x-2}$

16. $x = \frac{12}{2x+5}$

17. $\frac{x-2}{x-5} = \frac{x}{x-1}$

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

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

20. $\frac{3x-1}{x} = \frac{5}{5x-8}$

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

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

23. $\frac{2}{x} = \frac{4x+7}{5x^2+1}$

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

B

1. $x - \frac{3}{x} - 2 = 0$

2. $x + 7 + \frac{10}{x} = 0$

3. $x = 1 + \frac{42}{x}$

4. $1 + \frac{5}{x} + \frac{4}{x^2} = 0$

5. $x + 4 = \frac{12}{x}$

6. $5 - x = \frac{6}{x}$

7. $5 + \frac{6}{x} = 6x$

8. $x = 1 + \frac{1}{x}$

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

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

11. $\frac{8}{x} + 1 = \frac{1}{2}$

12. $\frac{3}{x} + 2 = \frac{1}{x}$

13. $\frac{2}{x} - \frac{3}{4} = 5$

14. $\frac{2}{3x} - \frac{1}{2} = \frac{1}{6}$

15. $\frac{3}{x} - 1 = \frac{1}{x}$

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

C

In these questions write your answers as simplified fractions.

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

2. $\frac{x}{4} + \frac{2}{5} = 3$

3. $\frac{x}{5} - \frac{1}{2} = 1$

4. $\frac{2x}{3} + \frac{1}{2} = 4$

5. $\frac{2x}{3} - \frac{2}{4} = 5$

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

7. $\frac{2x}{3} + 1 = \frac{7}{5}$

8. $\frac{5x}{4} - 2 = 7$

9. $\frac{3x}{2} + \frac{4}{5} = 2$

10. $2 + \frac{3x}{4} = \frac{x}{3}$

11. $\frac{x}{8} - \frac{x}{9} = \frac{1}{2}$

12. $\frac{2x}{3} + \frac{1}{5} = 3x$

13. $x - \frac{3x}{5} = \frac{2}{3}$

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

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

16. $\frac{2x}{3} - 1 = \frac{x}{5}$

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

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

19. $-\frac{3}{4} - \frac{5x}{7} = x - \frac{1}{2}$

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

D

In these questions write your answers as simplified fractions.

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

2. $\frac{2x-1}{3} - \frac{x}{2} = 5$

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

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

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

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

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

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

9. $1 + \frac{3x+2}{2} = \frac{4x+5}{5}$

10. $\frac{x}{3} + \frac{2x+3}{4} = \frac{3x+1}{2}$

11. $\frac{2x+3}{4} + \frac{2x-1}{3} = \frac{19}{12}$

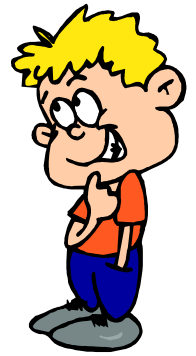
12. $x + \frac{x+1}{2} + \frac{x+2}{3} = 0$

13. $\frac{2(x-1)}{3} - \frac{3(2-x)}{2} = \frac{2}{3}$

14. $\frac{5x-4}{6} - \frac{x-16}{8} + 2 = \frac{x+28}{4}$

E In these questions write your answers as simplified fractions.

1. $2 + \frac{1}{x-1} = \frac{5}{2}$
2. $\frac{1}{x+1} - 1 = \frac{1}{3}$
3. $\frac{2}{1-x} - 1 = 0$
4. $2 + \frac{3}{5x-1} = 8x$
5. $2x + \frac{1}{x+1} = \frac{17}{12}$
6. $4x + \frac{1}{x-2} = 13$
7. $\frac{1}{x-3} - x + \frac{13}{6} = 0$
8. $\frac{x}{1-3x} - x = \frac{3}{4}$
9. $\frac{4}{x-1} + 1 = x$
10. $\frac{2}{x+2} - \frac{1}{3} = \frac{x}{3}$
11. $\frac{1}{2x+1} + \frac{1}{2} = 2x$
12. $\frac{3x}{x+2} + 1 = 2x$
13. $x - \frac{2}{x-1} - 2 = 0$
14. $\frac{2}{1-x} - 5 = \frac{3x}{2}$
15. $3 - \frac{1}{2-x} = x - \frac{1}{2}$
16. $\frac{x}{x+1} = \frac{5}{6} - x$
17. $\frac{2x}{3-x} = 12x$
18. $\frac{6}{7-3x} = x + \frac{1}{2}$
19. $2x + \frac{1}{x+\frac{1}{2}} = 2$
20. $x + \frac{3}{x-1} = \frac{2x}{1-x} + 9$



F Answers which are irrational write to 3 sig. Figs.

1. $\frac{2}{x+1} + \frac{1}{x+2} = \frac{11}{12}$
2. $\frac{40}{2x+1} + \frac{60}{x+1} = 49$
3. $\frac{3}{x-1} + \frac{3}{x+1} + 4 = 0$
4. $\frac{3}{x+3} - \frac{2}{x-1} = 3$
5. $\frac{4}{x} + \frac{1}{x+2} = -3$
6. $\frac{5}{x-1} + \frac{2}{x} = 5$
7. $\frac{7}{x+2} - \frac{1}{x} = \frac{16}{15}$
8. $\frac{1}{x} + \frac{1}{3x+2} = -2$
9. $\frac{3}{2x-1} - \frac{3}{2x+1} = 2$
10. $\frac{4}{x-2} - \frac{3}{x+3} = 3$
11. $\frac{4}{2x+4} - \frac{4}{3x-1} + 7 = 0$
12. $\frac{3}{x+1} - \frac{6}{2x+3} = 1$
13. $\frac{2}{x+2} + \frac{3}{x+3} = 2$
14. $\frac{5}{3x-1} + \frac{2}{1-x} = 14$
15. $\frac{6}{x} + \frac{15}{x+1} = 8$
16. $\frac{3}{x-1} + \frac{2}{x} = 4$
17. $\frac{2}{x+3} + \frac{1}{x+1} = 1$
18. $\frac{3}{1-x} - \frac{4}{2-x} = 1$
19. $\frac{1}{x} - \frac{2}{2-x} = -1$
20. $\frac{2}{x-1} + \frac{2}{x+2} + 1 = 0$
21. $\frac{9}{x-1} + \frac{8}{(x-1)^2} = -1$
22. $\frac{7}{x+2} - \frac{12}{(x+2)^2} = 1$
23. $\frac{10}{x+1} - \frac{25}{(x+1)^2} = 1$
24. $\frac{7}{x+4} + \frac{2}{(x+4)^2} = -3$
25. $\frac{1}{x} + \frac{1}{x+1} - \frac{2}{x+2} = 0$
26. $\frac{3}{x-1} - \frac{2x+1}{x^2-1} = \frac{2}{x+1}$
27. $\frac{1}{x^2-3x+5} = \frac{1}{x^2+x-3}$
28. $\frac{1}{x-1} + \frac{1}{x} = \frac{4}{2x+1}$
29. $\frac{3}{x+2} + \frac{1}{2x+1} = \frac{12x}{2x^2+5x+2}$
30. $\frac{1}{x^2+2x-1} = \frac{1}{x^2-2x+1}$
31. $\frac{2}{x+1} + \frac{1}{x-2} + \frac{3}{x} = 0$
32. $\frac{2}{x-1} - \frac{1}{x+1} + \frac{1}{x} = 0$
33. $\frac{3}{x+2} + \frac{2}{x+1} = \frac{4}{x-1}$
34. $\frac{3}{4-x} + \frac{2}{1-x} = \frac{2x-3}{4-5x+x^2}$
35. $\frac{2}{x+5} - \frac{4}{2x^2+13x+15} + \frac{1}{3+2x} = 0$
36. $\frac{12}{x^2-14x+40} = \frac{20}{x^2-4x-60}$
37. $\frac{1}{x^2+4x+3} + \frac{1}{x^2+3x+2} = \frac{1}{x^2+5x+6}$
38. $\frac{1}{x^2-9x+20} + \frac{1}{x^2-8x+15} = \frac{1}{x^2-7x+12}$
39. $\frac{2}{7x-4-3x^2} + \frac{1}{3x-1-2x^2} = \frac{1}{6x^2-11x+4}$
40. $\frac{1}{3(2-x)} + \frac{1}{4(2+x)} = \frac{1}{4-x^2}$
41. $\frac{1}{x^2-1} + \frac{3}{x^2+3x+2} = \frac{1}{x^2+x-2}$
42. $\frac{3}{2x^2+5x+3} + \frac{2}{4x^2+4x-3} = \frac{1}{2x^2+x-1}$