Add/Subtract Rational Expressions

Algorithm

1. find the common denominator by multiplying or by the reducing method
2. make equivalent fractions
3. add or subtract the numerators
4. simplify

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

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

Add or subtract as indicated:

1. a. $\frac{2}{x+3}+\frac{3}{2x+6}$ b. $\frac{2}{a^2+a}+\frac{2}{a+1}$

   c. $\frac{c^2}{3c-3d}-\frac{c+d}{3}$ d. $\frac{x+3}{x-3}-\frac{x+3}{4x-12}$

2. a. $\frac{5}{x^2-4}+\frac{3}{x+2}$ b. $\frac{t+7}{t-7}-\frac{14t}{t^2-49}$

   c. $\frac{3a}{a^2+6a-16}+\frac{3}{a+8}$ d. $\frac{m-4}{m-6}-\frac{3m}{m^2-3m-18}$

   e. $\frac{2x^2+5x}{x^2-8x-20}-\frac{x-2}{x-10}$ f. $\frac{2t^2+7}{t^2+t-2}-\frac{t-3}{t+2}$

   g. $\frac{6a^2}{a^2-9}-\frac{3a}{a+3}-\frac{2a}{a-3}$ h. $\frac{c-2}{c+2}+\frac{10c-4}{c^2-4}-\frac{c+2}{c-2}$

3. a. $\dfrac{15}{c^2-12c+36}+\dfrac{3c}{c-6}$ b. $\dfrac{4-b}{b^2-8b+16}+\dfrac{2}{b-4}$

c. $\dfrac{x-2}{x-1}-\dfrac{3-3x}{x^2-2x+1}$ d. $\dfrac{2}{a+2}+\dfrac{4}{(a+2)^2}$

e. $\dfrac{8x}{(x+4)^2}-\dfrac{4}{x+4}$ f. $\dfrac{c+4}{(c-4)^2}-\dfrac{c+4}{c-4}$

4. a. $\dfrac{2a+3b}{2a+2b}+\dfrac{a}{3a+3b}$ b. $\dfrac{c+2d}{4c-4d}+\dfrac{d}{3c-3d}$

5. a. $\dfrac{2}{2x-8}+\dfrac{3}{4x-2}$ b. $\dfrac{b-2x}{4b+2x}-\dfrac{2b-x}{2b+4x}$

6. a. $\dfrac{5}{3x+15}+\dfrac{4}{x^2-25}$ b. $\dfrac{c+5d}{c^2-d^2}-\dfrac{2d}{c^2-cd}$

c. $\dfrac{a-4}{2a-10}+\dfrac{a}{a^2-10a+26}$ d. $\dfrac{4x}{3x^2-3y^2}-\dfrac{x-y}{x^2+2xy+y^2}$

e. $\dfrac{x}{x^2+5x+4}-\dfrac{1}{x^2+2x+1}$ f. $\dfrac{2n}{5n^2-5n-30}+\dfrac{3n}{4n^2+20n+24}$

g. $\dfrac{2}{x^2-4}-\dfrac{3}{x^2-4x+4}+\dfrac{4}{x^2+x-2}$