Adding and subtracting rational expressions

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

2. $\frac{3y^2-19y}{y^2-25} + \frac{y^2-y}{y^2-25} = \frac{4y^2-20y}{y^2-25}$

$= \frac{4(y^2-5y)}{y^2-25} = \frac{4(y(y-5)}{(y-5)(y+5)} = \frac{4y}{y+5}$

3. $\frac{8m^2}{10m^3+60m^2} - \frac{6m^2-12m}{10m^3+60m^2} = \frac{2m^2+12m}{10m^2(m+6)} = \frac{2m(m+6)}{10m^2(m+6)}$

$= \frac{1}{5m}$

4. $\frac{v^2-4v}{5v^2+9v-2} - \frac{2v+16}{5v^2+9v-2} = \frac{v^2-6v-16}{5v^2+9v-2}$

$= \frac{(v+2)(v-8)}{(5v-1)(v+2)} = \frac{(v-8)}{5v-1}$

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

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

$= \frac{(k+1)(k+3)}{(k+1)(k-1)} = \frac{(k+3)}{(k-1)}$

6. $\frac{22w+11}{8w^2-6w} - \frac{3}{2w} = \frac{(4w-3)(22w+11) - 3(4w-3)}{8w^2-6w}$

$= \frac{22w+11-12w+9}{8w^2-6w} = \frac{10w+20}{8w^2-6w}$

$= \frac{5(w+2)}{2w(4w-3)} = \frac{5(w+2)}{w(4w-3)}$

7. $\frac{x}{2x-5} - \frac{4x+15}{4x^2-25} = \frac{x(2x+5) - 4x+15}{4x^2-25}$

$= \frac{2x^2+5x-4x-15}{4x^2-25}$

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

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

8. $\frac{8a-18}{3a^2+14a+8} + \frac{7}{3a+2} = \frac{8a-18+7(a+4)}{(3a+2)(a+4)}$

$= \frac{8a-18+7a+28}{(3a+2)(a+4)}$ $= \frac{15a+10}{(3a+2)(a+4)}$ $= \frac{5(3a+2)}{(3a+2)(a+4)} = \frac{5}{a+4}$