Adding and Subtracting Rational Expressions Name Key

Add or subtract. Simplify where possible.

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

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

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

4. $\frac{-8}{3x^2}-\frac{11}{3x^2}$ $= \frac{-19}{3x^2}$

5. (4) $\frac{11}{6x}+\frac{2}{24x}$ $= \frac{44+2}{24x}$ LCD = 24x $= \frac{46}{24x}$ $= \frac{23}{12x}$

6. (x) $\frac{9}{5x}-\frac{2}{x^2}$ (5) $= \frac{9x-10}{5x^2}$ LCD = $5x^2$

7. (5) $\frac{3x}{3x^2}-\frac{6x+2}{5}$ (3) $= \frac{15x-18x-6}{15x^2}$ LCD = $15x^2$ $= \frac{-3x-6}{15x^2}$ $= \frac{-3(x+2)}{15x^2}$ $= \frac{(x+2)}{-5x^2}$

8. (3c) $\frac{2x}{5ab^3}+\frac{4y}{3a^2b^2}$ (5b) $= \frac{6ax+20by}{15a^2b^3}$ LCD = $15a^2b^3$

9. (2) $\frac{3x+2}{(x+y)}+\frac{4}{(2x+2y)}$ $2(x+y)$ LCD = $2(x+y)$ $= \frac{6x+4+4}{2(x+y)}$ $= \frac{6x+8}{2(x+y)}$ $= \frac{2(3x+4)}{2(x+y)}$ $= \frac{(3x+4)}{(x+y)}$

10. $\frac{(x+2)}{1}5+\frac{x-3}{(x+2)}$ $= \frac{5x+10+x-3}{(x+2)}$ LCD = (x+2) $= \frac{(6x+7)}{(x+2)}$

Add or subtract. Simplify where possible.

11. $\frac{6}{x-2}+\frac{65}{x+1}$

LCD $=(x-2)(x+1)$

$(x+1)\frac{6}{(x-2)}+\frac{65}{(x+1)}(x-2)=\frac{6x+6+65x-130}{(x-2)(x+1)}$

$=\boxed{\frac{71x-124}{(x-2)(x+1)}}$

12. $\frac{3}{x-8}-\frac{7}{x+3}$

LCD $=(x-8)(x+3)$

$(x+3)\frac{3}{(x-8)}-\frac{7}{(x+3)}(x-8)=\frac{3x+9-7x+56}{(x-8)(x+3)}$

$=\boxed{\frac{-4x+65}{(x-8)(x+3)}}$

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

LCD $=(x+3)(x+5)$

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

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

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

14. $\frac{2}{2x+12}+\frac{8}{2x}$

$2(x+6)$

LCD $=2x(x+6)$

$(x)\frac{2}{(2x+12)}+\frac{8}{2x}(x+6)=\frac{2x+8x+48}{2x(x+6)}$

$=\frac{10x+48}{2x(x+6)}$

$=\frac{2(5x+24)}{2x(x+6)}$

$=\boxed{\frac{(5x+24)}{x(x+6)}}$

15. $\frac{x-8}{2}-\frac{3x^2-2x+7}{5x^2}$

LCD $=10x^2$

$(5x^2)\frac{x-8}{2}-\frac{3x^2-2x+7}{5x^2}(2)=\frac{5x^3-40x^2-6x^2-4x+14}{10x^2}$

$=\boxed{\frac{5x^3-46x^2-4x+14}{10x^2}}$

16. $\frac{3x}{3x^2}-\frac{6x+2}{5}$

LCD $=15x^2$

$(5)\frac{3x}{3x^2}-\frac{6x+2}{5}(3x^2)=\frac{15x-18x^3+6x^2}{15x^2}$

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

$=\boxed{\frac{(5-6x^2+2x)}{5x}}$