

# Adding & Subtracting Rational Expressions

7. Simplify and state any restrictions.

a)  $\frac{x+1}{18} + \frac{x-1}{45}$

b)  $\frac{x+10}{12} - \frac{2x-1}{15}$

c)  $\frac{2}{3x} - \frac{1}{4x}$

d)  $\frac{7}{6x} + \frac{3}{8x}$

e)  $\frac{3}{ab} + \frac{5}{4b}$

f)  $\frac{13}{10a^2b} + \frac{11}{4b^2}$

g)  $\frac{2+a}{a^2b} + \frac{4-a}{3ab^2}$

h)  $\frac{4-ab}{9ab} + \frac{2ab}{6a^2b^2}$

For help with questions 8 and 9, refer to Example 4.

8. Simplify and state the restrictions.

a)  $\frac{1}{x-6} - \frac{1}{x+6}$

b)  $\frac{12}{x+8} + \frac{3}{x-9}$

c)  $\frac{x+10}{x-6} - \frac{x-3}{x+4}$

d)  $\frac{x+5}{x+1} + \frac{x+2}{x-2}$

9. Simplify and state the restrictions.

a)  $\frac{x}{x^2 - 9x + 8} + \frac{2}{x-8}$

b)  $\frac{x+3}{x+5} + \frac{x+2}{x^2 + 3x - 10}$

c)  $\frac{x}{x^2 + 3x + 2} - \frac{3x-2}{x^2 + 8x + 7}$

d)  $\frac{x+4}{x^2 - 121} - \frac{2x-1}{x^2 + 8x - 33}$

## Answers

7. a)  $\frac{7x+3}{90}$ , no restrictions

b)  $\frac{-x+18}{20}$ , no restrictions

c)  $\frac{5}{12x}, x \neq 0$

d)  $\frac{37}{24x}, x \neq 0$

e)  $\frac{12+5a}{4ab}, a \neq 0, b \neq 0$

f)  $\frac{26b+55a^2}{20a^2b^2}, a \neq 0, b \neq 0$

g)  $\frac{6b+3ab+4a-a^2}{3a^2b^2}, a \neq 0, b \neq 0$

h)  $\frac{7-ab}{9ab}, a \neq 0, b \neq 0$

8. a)  $\frac{12}{(x-6)(x+6)}, x \neq -6, x \neq 6$

b)  $\frac{15x-84}{(x+8)(x-9)}, x \neq -8, x \neq 9$

c)  $\frac{23x+22}{(x-6)(x+4)}, x \neq -4, x \neq 6$

d)  $\frac{2(x+4)(x-1)}{(x+1)(x-2)}, x \neq -1, x \neq 2$

9. a)  $\frac{3x-2}{(x-1)(x-8)}, x \neq 1, x \neq 8$

b)  $\frac{x^2+2x-4}{(x+5)(x-2)}, x \neq -5, x \neq 2$

c)  $\frac{-2x^2+3x+4}{(x+1)(x+2)(x+7)}, x \neq -7, x \neq -2, x \neq -1$

d)  $\frac{-(x-23)(x-1)}{(x+1)(x-11)(x-3)}, x \neq -11, x \neq 3, x \neq 11$