Practice – Adding and Subtracting Rational Expressions

*** Key Problems: try the ODD numbered problems first**

Simplify each rational expression. State any restrictions on the variables.

1 $\frac{3}{x}+\frac{4}{y}$ **2** $\frac{3}{2x}-\frac{1}{4x}$ **3** $\frac{1}{3x}+\frac{1}{6x^2}$ **4** $\frac{2}{ab}+\frac{3}{ac}-\frac{5}{bc}$

5 $\frac{1}{x+2}+\frac{1}{x-2}$ **6** $\frac{x}{x+4}-\frac{5}{x-3}$ **7** $\frac{x-2}{x+4}+\frac{x+3}{x-2}$ **8** $\frac{x^2-2x+1}{x-3}-x$

9 $\frac{1}{x+5}-\frac{2x}{x^2+3x-10}$ **10** $\frac{5x}{x-8}+\frac{4}{x^2-5x-24}$ **11** $\frac{7}{x-1}+\frac{6}{x}-\frac{5}{x+1}$ **12** $\frac{3}{x+3}-\frac{x}{4}+\frac{5}{x-5}$

Answers:

1 $\frac{3y+4x}{xy}$; $x, y \neq 0$

2 $\frac{5}{4x}$; $x \neq 0$

3 $\frac{2x+1}{6x^2}$; $x \neq 0$

4 $\frac{2c+3b-5a}{abc}$; $a, b, c \neq 0$

5 $\frac{2x}{x^2-4}$; $x \notin \{-2, 2\}$

6 $\frac{(x-10)(x+2)}{(x+4)(x-3)} = \frac{x^2-8x-20}{x^2+x-12}$; $x \notin \{-4, 3\}$

7 $\frac{2x^2+3x+16}{(x+4)(x-2)}$; $x \notin \{-4, 2\}$

8 $\frac{x+1}{x-3}$; $x \neq 3$

9 $\frac{-(x+2)}{x^2+3x-10}$; $x \notin \{-5, 2\}$

10 $\frac{5x^2+15x+4}{(x-8)(x+3)} = \frac{5x^2+15x+4}{x^2-5x-24}$; $x \notin \{-3, 8\}$

11 $\frac{58+12x-6}{x^3-x^2}$; $x \notin \{-1, 0, 1\}$

12 $\frac{-x(x^2-2x-27)}{4(x+3)(x-5)} = \frac{-x^3+2x^2+47x}{4x^2-8x-60}$; $x \notin \{-3, 5\}$

Textbook error; should be:
2(4x^2 + 6x - 3) / x (x+1)(x-1)