2.1/2.2 Adding and Subtracting Rational Expressions – Worksheet

MCR3U

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1) Simplify and state any restrictions

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

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

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

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

2) Simplify and state the restrictions.

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

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

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

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

3) Simplify and state the restrictions.

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

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

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

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

4) Binomial expressions can differ by a factor of -1. Factor -1 from one of the denominators to identify the common denominator. Then, simplify each expression and state the restrictions.

a) $\dfrac{1}{x-2} - \dfrac{1}{2-x}$

b) $\dfrac{2b+3}{4b-1} + \dfrac{b+6}{1-4b}$

Answers

1) a) $\dfrac{7x+3}{90}$, no restrictions **b)** $\dfrac{5}{12x}, x \neq 0$ **c)** $\dfrac{12+5a}{4ab}, a \neq 0, b \neq 0$ **d)** $\dfrac{6b+3ab+4a-a^2}{3a^2b^2}, a \neq 0, b \neq 0$

2) a) $\dfrac{12}{(x-6)(x+6)}$, $x \neq -6, 6$ **b)** $\dfrac{15x-84}{(x+8)(x-9)}$, $x \neq -8, 9$ **c)** $\dfrac{23x+22}{(x-6)(x+4)}, x \neq -4, x \neq 6$ **d)** $\dfrac{2(x+4)(x-1)}{(x+1)(x-2)}, x \neq -1, 2$

3) a) $\dfrac{3x-2}{(x-1)(x-8)}, x \neq 1, 8$ **b)** $\dfrac{x^2+2x-4}{(x+5)(x-2)}, x \neq -5, 2$ **c)** $\dfrac{-2x^2+3x+4}{(x+1)(x+2)(x+7)}, x \neq -7, -2, -1$ **d)** $\dfrac{-(x-23)(x-1)}{(x+11)(x-11)(x-3)}, x \neq -11, 3, 11$

4) a) $\dfrac{2}{x-2}, x \neq 2$ **b)** $\dfrac{b-3}{4b-1}, b \neq \dfrac{1}{4}$