

Rational Expressions Part 3

Simplify each expression.

$$1) \frac{2a}{24ab^2} - \frac{a-6b}{24ab^2} = \frac{2a-(a-6b)}{24ab^2} = \frac{2a-a+6b}{24ab^2} = \frac{a+6b}{24ab^2}$$

$$2) \frac{x-6y}{12x} + \frac{2x+2y}{12x} = \frac{3x-4y}{12x}$$

$$3) \frac{4y^2 \cdot 4y}{4y^2 \cdot 5y} + \frac{3x \cdot 5}{4y^3 \cdot 5} = \frac{16y^3+15x}{20y^3} = \frac{15x+16y^3}{20y^3}$$

↑ either answer ↑

$$4) \frac{2 \cdot 5}{2 \cdot 2m^2n} - \frac{6m \cdot m}{4mn \cdot m} = \frac{10-6m^2}{4m^2n} = \frac{2(5-3m^2)}{4m^2n} = \frac{5-3m^2}{2m^2n}$$

$$5) \frac{r-3}{5r-15} + \frac{r+1}{5r-15} = \frac{2(r-1)}{5(r-3)} \text{ ev: } \{3\}$$

$$6) \frac{(k+4) \cdot 2}{(k+4) \cdot 3k+4} - \frac{6(3k+4)}{k+4(3k+4)} = \frac{2k+8-(18k+24)}{(3k+4)(k+4)} = \frac{-16(k+1)}{(3k+4)(k+4)} \text{ ev: } \{-4, -\frac{4}{3}\}$$

$$7) \frac{5k^3(6k-2)}{5k^3(5k-4)} - \frac{6(5k-4)}{5k^3(5k-4)}$$

$$8) \frac{(n+4) \cdot 5n}{(n+4) \cdot 2} - \frac{4 \cdot 2}{(n+4) \cdot 2} = \frac{5n^2+20n-8}{2(n+4)}$$

$$\frac{30k^4-10k^3-(30k-24)}{5k^3(5k-4)} = \frac{30k^4-10k^3-30k+24}{5k^3(5k-4)} = \frac{2(15k^4-5k-15k+12)}{5k^3(5k-4)} \text{ ev: } \{0, \frac{4}{5}\}$$

$$\text{ev: } \{-4\}$$

$$9) \frac{v+6}{4v^3-64v} + \frac{6v+6}{4v^3-64v}$$

$$10) \frac{(x+4) \cdot 2}{(x+4)(x+5)} - \frac{4x(x+5)}{x+4(x+5)}$$

$$\frac{7v+12}{4v^3-64v} \text{ ev: } \{-4, 0, 4\}$$

$$\frac{2x+8-(4x^2+20x)}{(x+4)(x+5)} = \frac{-4x^2-18x+8}{(x+4)(x+5)} = \frac{-2(2x^2+9x+4)}{(x+4)(x+5)}$$

$$4v(v^2-16) = 4v(v-4)(v+4)$$

$$\text{ev: } \{-5, -4\}$$

$$11) \frac{(2a+1) \cdot 4}{(2a+1) \cdot 10a+4} + \frac{5a \cdot 2(5a+2)}{(2a+1) \cdot 2(5a+2)}$$

$$\frac{8a+4 + 50a^2+20a}{2(5a+2)(2a+1)} = \frac{50a^2+28a+4}{2(5a+2)(2a+1)} = \frac{2(25a^2+14a+2)}{2(5a+2)(2a+1)}$$

$$= \frac{25a^2+14a+2}{(2a+1)(5a+2)} \quad \text{ev: } \left\{ -\frac{1}{2}, -\frac{2}{5} \right\}$$

$$12) 4 + \frac{(3n+2)(n-5)}{3n^2-13n-10} =$$

$$\frac{12n^2-52n-46+n-1}{(3n+2)(n-5)} = \frac{12n^2-51n-41}{(n-5)(3n+2)}$$

$$\text{ev: } \left\{ -\frac{2}{3}, 5 \right\}$$

$$13) \frac{(2a-1) \cdot 3}{(2a-1)(a+1)} - \frac{2a(a+1)}{(2a-1)(a+1)}$$

$$\frac{6a-3-(2a^2+2a)}{(2a-1)(a+1)} = \frac{-2a^2+4a-3}{(2a-1)(a+1)} \quad \text{ev: } \left\{ -1, \frac{1}{2} \right\}$$

$$14) \frac{2}{x-3} + \frac{x+5}{3-x}$$

$$= \frac{-x+3}{x-3} \quad \text{ev: } \{3\}$$

$$15) \frac{(5x+2) \cdot (3x+4)}{(5x+2) \cdot (x-4)(2x+3)} - \frac{(2x-3) \cdot (2x+3)}{(x-4)(5x+2)}$$

$$\frac{15x^2+26x+8-(4x^2-9)}{(5x+2)(x-4)(2x+3)} = \frac{11x^2+26x+17}{(5x+2)(x-4)(2x+3)}$$

$$\text{ev: } \left\{ -\frac{3}{2}, -\frac{2}{5}, 4 \right\}$$

$$16) \frac{(x+4) \cdot 2}{(x+4) \cdot (x-4)(x+4)} + \frac{x+1}{(x+4)(x+4)} + \frac{3 \cdot (x+4)^2}{(x-4)(x+4)^2}$$

$$\frac{2x+8+x+1+3x^2+24x+48}{(x+4)^2(x-4)} = \frac{3x^2+27x+57}{(x+4)^2(x-4)}$$

$$\text{ev: } \{4, 4\}$$

$$17) \frac{(5r+6) \cdot 4}{(5r+6)(r-1)} + \frac{3r(r-1)}{(5r+6)(r-1)}$$

$$\frac{20r+24+3r^2-3r}{(5r+6)(r-1)} = \frac{3r^2+17r+24}{(5r+6)(r-1)}$$

$$\text{ev: } \left\{ -\frac{6}{5}, 1 \right\}$$

$$18) \frac{(a+3) \cdot 4}{(a+3) \cdot 15a^2+6a} - \frac{5 \cdot 15a^2+6a}{(a+3) \cdot 3a(5a+2)}$$

$$\frac{4a+12-(75a^2+30a)}{3a(a+3)(5a+2)} = \frac{-75a^2-26a+12}{3a(a+3)(5a+2)}$$

$$\text{ev: } \left\{ -3, -\frac{2}{5}, 0 \right\}$$

$$19) \frac{3x}{x^2-4x+4} - \frac{5(x+4) \cdot (x-2)}{(x+4)(x-2) \cdot (x-2)}$$

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

$$= \frac{-2(x-5)}{(x-2)^2} \quad \text{ev: } \{ -4, 2 \}$$

$$20) \frac{(x-2) \cdot (x+1)}{(x+2)(x^2-2x+4)} + \frac{2 \cdot (x^2-2x+4)}{(x-2)(x+2)(x^2-2x+4)}$$

$$\frac{x^2-x-2+2x^2-4x+8}{(x-2)(x+2)(x^2-2x+4)}$$

$$= \frac{3x^2-5x+6}{(x-2)(x+2)(x^2-2x+4)} \quad \text{ev: } \{ -2, 2 \}$$

Rational Expressions Part 3

Simplify each expression.

1) $\frac{2a}{24ab^2} - \frac{a-6b}{24ab^2}$

2) $\frac{x-6y}{12x} + \frac{2x+2y}{12x}$

3) $\frac{4y}{5y} + \frac{3x}{4y^3}$

4) $\frac{5}{2m^2n} - \frac{6m}{4mn}$

5) $\frac{r-3}{5r-15} + \frac{r+1}{5r-15}$

6) $\frac{2}{3k+4} - \frac{6}{k+4}$

7) $\frac{6k-2}{5k-4} - \frac{6}{5k^3}$

8) $\frac{5n}{2} - \frac{4}{n+4}$

9) $\frac{v+6}{4v^3-64v} + \frac{6v+6}{4v^3-64v}$

10) $\frac{2}{x+5} - \frac{4x}{x+4}$

$$11) \frac{4}{10a+4} + \frac{5a}{2a+1}$$

$$12) 4 + \frac{n-1}{3n^2-13n-10}$$

$$13) \frac{3}{a+1} - \frac{2a}{2a-1}$$

$$14) \frac{2}{x-3} + \frac{x+5}{3-x}$$

$$15) \frac{3x+4}{2x^2-5x-12} - \frac{2x-3}{5x^2-18x-8}$$

$$16) \frac{2}{x^2-16} + \frac{x+1}{x^2+8x+16} + \frac{3}{x-4}$$

$$17) \frac{4}{r-1} + \frac{3r}{5r+6}$$

$$18) \frac{4}{15a^2+6a} - \frac{5}{a+3}$$

$$19) \frac{3x}{x^2-4x+4} - \frac{5x+20}{x^2+2x-8}$$

$$20) \frac{x+1}{x^3+8} + \frac{2}{x^2-4}$$