

Notes: Add and Subtract Rational Expressions

Simplify each expression.

1) $\frac{u+3v}{8u^3} - \frac{u-4v}{8u^3}$

2) $\frac{a+3b}{9a^3} + \frac{6a}{9a^3}$

3) $\frac{5}{b^2-36} + \frac{b+5}{b^2-36}$

4) $\frac{5m-2}{6m^2-36m} + \frac{6}{6m^2-36m}$

5) $\frac{x+5y}{5} - \frac{6x}{4x^3}$

6) $\frac{3m}{4n} + \frac{4m}{6m}$

7) $\frac{6x}{2xy} + \frac{3x}{5x^3}$

8) $\frac{6b}{5a} - \frac{2a}{5ab^2}$

9) $\frac{2}{15(x+1)} + \frac{x+5}{3}$

10) $\frac{6}{x-5} + \frac{x+1}{3x+1}$

11) $\frac{p-5}{2(p+1)} + \frac{2p}{3}$

12) $\frac{n+6}{5n+3} + \frac{3}{4n}$

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

14) $\frac{6x}{3x} + \frac{5x}{x-4}$

15) $\frac{2n}{3n+6} + \frac{6}{n+4}$

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

Notes: Add and Subtract Rational Expressions

Simplify each expression. Must have Common Denominators!

$$1) \frac{u+3v}{8u^3} - \frac{u-4v}{8u^3}$$

$$= \frac{u+3v-u+4v}{8u^3} = \frac{7v}{8u^3}$$

$$2) \frac{a+3b}{9a^3} + \frac{6a}{9a^3} = \frac{a+3b+6a}{9a^3}$$

$$= \frac{7a+3b}{9a^3}$$

$$3) \frac{5}{b^2-36} + \frac{b+5}{b^2-36}$$

$$= \frac{5+b+5}{b^2-36} = \frac{10+b}{b^2-36}$$

$$4) \frac{5m-2}{6m^2-36m} + \frac{6}{6m^2-36m}$$

$$\frac{5m-2+6}{6m^2-36m} = \frac{5m+4}{6m^2-36m}$$

$$5) \frac{x+5y}{5} - \frac{6x}{4x^3}$$

Butterfly

$$\frac{4x^3(x+5y) - 30x}{20x^3} = \frac{4x^4+20x^3y-30x}{20x^3}$$

$$6) \frac{3m}{4n} + \frac{4m}{6m}$$

$$= \frac{18m^2+16mn}{24mn}$$

$$= \frac{9m+8n}{12n}$$

$$7) \frac{6x}{2xy} + \frac{3x}{5x^3} = \frac{30x^4+6x^2y}{10x^4y}$$

$$= \frac{15x^2+3y}{5x^2y}$$

$$8) \frac{6b}{5a} - \frac{2a}{5ab^2} = \frac{30ab^3-10a^2}{25a^2b^2}$$

$$= \frac{6b^3-2a}{5ab^2}$$

$$9) \frac{2}{15(x+1)} + \frac{(x+5) \cdot 5(x+1)}{3 \cdot 5(x+1)}$$

$$\frac{2+5(x+5)(x+1)}{15(x+1)} = \frac{2+5x^2+30x+25}{15(x+1)}$$

$$= \frac{5x^2+30x+27}{15(x+1)}$$

$$10) \frac{6}{x-5} + \frac{x+1}{3x+1}$$

$$\frac{6(3x+1) + (x-5)(x+1)}{(x-5)(3x+1)}$$

$$11) \frac{p-5}{2(p+1)} + \frac{2p}{3}$$

$$12) \frac{n+6}{5n+3} + \frac{3}{4n} = \frac{4n(n+6) + 3(5n+3)}{4n(5n+3)}$$

$$\frac{3(p-5) + 2p \cdot 2(p+1)}{6(p+1)}$$

$$13) \frac{4}{3} - \frac{k+3}{3k^2-3k}$$

$$14) \frac{6x}{3x} + \frac{5x}{x-4} = \frac{6x(x-4) + 3x \cdot 5x}{3x(x-4)}$$

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

$$15) \frac{2n}{3n+6} + \frac{6}{n+4}$$

$$16) \frac{4n}{2n^2} - \frac{6n}{2n-5} = \frac{4n(2n-5) - 2n^2 \cdot 6n}{2n^2(2n-5)}$$

$$\frac{2n(n+4) + 6(3n+6)}{(3n+6)(n+4)}$$

HW: Add and Subtract Rational Expressions

Simplify each expression.

1) $\frac{u-v}{30v} - \frac{6}{30v}$

2) $\frac{x+5y}{12x^2} + \frac{x+3y}{12x^2}$

3) $\frac{n-5}{6n^3-18n^2} + \frac{n+2}{6n^3-18n^2}$

4) $\frac{a-5}{18a+9} + \frac{5a+1}{18a+9}$

5) $\frac{2}{4b} + \frac{4}{2b^2}$

6) $\frac{2a}{4b} + \frac{3}{5a}$

7) $\frac{4}{6y} - \frac{4y}{4x}$

8) $\frac{4n}{6} - \frac{3}{3n^2}$

9) $\frac{6n}{n-3} + \frac{3}{n-5}$

10) $\frac{4}{2(p+2)} - \frac{2p}{3}$

11) $\frac{3}{4n(n+3)} - \frac{5}{3}$

12) $\frac{5}{3} - \frac{x+5}{x-5}$

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

14) $\frac{2}{2x} - \frac{5}{15x^2-12x}$

15) $\frac{6x}{2x+2} - \frac{4}{5x-3}$

16) $\frac{6}{p+3} + \frac{6}{4}$

HW: Add and Subtract Rational Expressions

Simplify each expression.

$$1) \frac{u-v}{30v} - \frac{6}{30v}$$

$$\frac{u-v-6}{30v}$$

$$2) \frac{x+5y}{12x^2} + \frac{x+3y}{12x^2}$$

$$\frac{x+4y}{6x^2}$$

$$3) \frac{n-5}{6n^3-18n^2} + \frac{n+2}{6n^3-18n^2}$$

$$\frac{2n-3}{6n^3-18n^2}$$

$$4) \frac{a-5}{18a+9} + \frac{5a+1}{18a+9}$$

$$\frac{6a-4}{18a+9}$$

$$5) \frac{2}{4b} + \frac{4}{2b^2}$$

$$\frac{b+4}{2b^2}$$

$$6) \frac{2a}{4b} + \frac{3}{5a}$$

$$\frac{5a^2+6b}{10ba}$$

$$7) \frac{4}{6y} - \frac{4y}{4x}$$

$$\frac{2x-3y^2}{3yx}$$

$$8) \frac{4n}{6} - \frac{3}{3n^2}$$

$$\frac{2n^3-3}{3n^2}$$

$$9) \frac{6n}{n-3} + \frac{3}{n-5}$$

$$\frac{6n^2-27n-9}{(n-5)(n-3)}$$

$$10) \frac{4}{2(p+2)} - \frac{2p}{3}$$

$$\frac{-2p^2-4p+6}{3(p+2)}$$

$$11) \frac{3}{4n(n+3)} - \frac{5}{3}$$

$$\frac{9-20n^2-60n}{12n(n+3)}$$

$$12) \frac{5}{3} - \frac{x+5}{x-5}$$

$$\frac{2x-40}{3(x-5)}$$

$$13) \frac{5x}{2} + \frac{2}{4x-2}$$

$$\frac{10x^2-5x+2}{2(2x-1)}$$

$$14) \frac{2}{2x} - \frac{5}{15x^2-12x}$$

$$\frac{15x-17}{3x(5x-4)}$$

$$15) \frac{6x}{2x+2} - \frac{4}{5x-3}$$

$$\frac{15x^2-13x-4}{(5x-3)(x+1)}$$

$$16) \frac{6}{p+3} + \frac{6}{4}$$

$$\frac{21+3p}{2(p+3)}$$