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Practice

Form G

Adding and Subtracting Rational Expressions

Find the least common multiple of each pair of polynomials.

1. $3x(x+2)$ and $6x(2x-3)$
 $6x(x+2)(2x-3)$

2. $2x^2 - 8x + 8$ and $3x^2 + 27x - 30$

3. $4x^2 + 12x + 9$ and $4x^2 - 9$
 $(2x+3)(2x+3)(2x-3)$

4. $2x^2 - 18$ and $5x^3 + 30x^2 + 45x$

Simplify each sum or difference. State any restrictions on the variables.

5. $\frac{x^2}{5} + \frac{x^2}{5} = \frac{2x^2}{5}$

6. $\frac{6y-4}{y^2-5} + \frac{3y+1}{y^2-5}$

7. $\frac{2y+1}{3y} + \frac{5y+4}{3y} = \frac{7y+5}{3y}$

8. $\frac{12}{xy^3} - \frac{9}{xy^3}$

9. $-\frac{2}{n+4} - \frac{n^2}{n^2-16} = \frac{-(n-2)}{n-4}$

10. $\frac{3}{8x^3y^3} - \frac{1}{4xy}$

11. $\frac{6}{5x^2y} + \frac{5}{10xy^2} = \frac{12y+5x}{10x^2y^2}$

12. $\frac{x+2}{x^2+4x+4} + \frac{2}{x+2}$

13. $\frac{4}{x^2-25} + \frac{6}{x^2+6x+5} = \frac{2(5x-13)}{(x-5)(x+5)(x+1)}$

14. $\frac{y}{4y+8} - \frac{1}{y^2+2y}$

Simplify each complex fraction.

15. $\frac{\frac{2}{x}}{\frac{3}{y}} = \frac{2y}{3x}$

16. $\frac{1 + \frac{2}{x}}{4 - \frac{6}{x}}$

17. $\frac{\frac{1}{x-2}}{2 + \frac{1}{x}} = \frac{x}{(x-2)(2x+1)}$

18. $\frac{\frac{3}{x+1}}{\frac{5}{x-1}}$

19. $\frac{\frac{4}{x^2-1}}{\frac{3}{x+1}} = \frac{4}{3(x-1)}$

20. $\frac{1 + \frac{2}{3}}{\frac{4}{9}}$

21. $\frac{\frac{2}{x} + 6}{\frac{1}{y}} = \frac{2y+6xy}{x}$

22. $\frac{\frac{x+3}{x-3}}{\frac{x^2-9}{3x-9}}$

23. $\frac{\frac{5}{x+3}}{2 + \frac{1}{x+3}} = \frac{5}{2x+7}$

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Standardized Test Prep

Adding and Subtracting Rational Expressions

Multiple Choice

For Exercises 1–4, choose the correct letter.

1. Which is the least common denominator of fractions that have denominators $5x + 10$ and $25x^2 - 100$?

(A) $5(x - 2)$

(C) $25(x^2 - 4)$

(B) $5(x^2 - 20)$

(D) $75(x + 2)(x^2 - 4)$

2. Which expression equals $\frac{\frac{2}{x} + 6}{\frac{1}{y}}$?

(F) $\frac{12y}{x}$

(G) $\frac{2y + 6xy}{x}$

(H) $\frac{6x + 2}{xy}$

(I) $\frac{x}{2y + 6xy}$

3. Which expression equals $\frac{4}{x^2 - 3x} + \frac{6}{3x - 9}$?

(A) $\frac{2(x + 2)}{x(x - 3)}$

(B) $\frac{10}{x^2 - 9}$

(C) $\frac{4x + 18}{3x(x - 3)}$

(D) $\frac{2}{x}$

4. The harmonic mean of two numbers a and b equals $\frac{2}{\frac{1}{a} + \frac{1}{b}}$. Which expression equals the harmonic mean of x and $x + 1$?

(F) $\frac{2}{x^2 + x}$

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

(H) $2x + 1$

(I) $\frac{2x^2 + 2x}{2x + 1}$

Short Response

5. Subtract $3 - \frac{1}{x^2 + 5}$. Write your answer in simplest form. State any restrictions on the variable. Show your work.

$$\frac{3x^2 + 14}{x^2 + 5}$$