Name _____ Class _____ Date _____

Practice 9-5

Adding and Subtracting Rational Expressions

Find the least common multiple of each pair of polynomials.

1. $3x(x + 2)$ and $6x(2x - 3)$
2. $2x^2 - 8x + 8$ and $3x^2 + 27x - 30$
3. $4x^2 + 12x + 9$ and $4x^2 - 9$
4. $2x^2 - 18$ and $5x^3 + 30x^2 + 45x$

Simplify.

5. $\frac{x^2}{5} + \frac{x^2}{5}$
6. $\frac{x^2 - 2}{12} + \frac{x}{6}$
7. $\frac{12}{xy^3} - \frac{9}{xy^3}$
8. $-\frac{2}{n + 4} - \frac{n^2}{n^2 - 16}$
9. $\frac{x}{9} - \frac{2x}{9}$
10. $\frac{2y + 1}{3y} + \frac{5y + 4}{3y}$
11. $\frac{6y - 4}{y^2 - 5} + \frac{3y + 1}{y^2 - 5}$
12. $\frac{6}{5x^2y} + \frac{5}{10xy^2}$
13. $\frac{3}{8x^3y^3} - \frac{1}{4xy}$
14. $\frac{4}{x^2 - 25} + \frac{6}{x^2 + 6x + 5}$
15. $\frac{3}{7x^2y} + \frac{4}{21xy^2}$
16. $\frac{xy - y}{x - 2} - \frac{y}{x + 2}$
17. $\frac{x + 2}{x^2 + 4x + 4} + \frac{2}{x + 2}$
18. $\frac{3}{x^2 - x - 6} + \frac{2}{x^2 + 6x + 5}$
19. $\frac{1}{6x^2 - 11x + 3} + \frac{1}{8x^2 - 18}$
20. $\frac{4}{x^2 - 3x} + \frac{6}{3x - 9}$
21. $\frac{3}{x^2 + 3x - 10} + \frac{1}{x^2 + 6x + 5}$
22. $\frac{3}{x - 9} + 4x$
23. $3 - \frac{1}{x^2 + 5}$
24. $5 + \frac{1}{x^2 - 5x + 6}$
25. $1 + \frac{2x + 7}{3x - 1}$
26. $\frac{2a}{a + 2} + \frac{3a}{a - 2}$
27. $\frac{4c}{c - 3} + \frac{4c}{c + 3}$
28. $\frac{f + 1}{fgh} + \frac{f - 1}{fgh}$
29. $\frac{2 - t}{t - 5} + \frac{2 + t}{t + 5}$
30. $\frac{4r}{r - 2} + \frac{4r}{r + 2}$
31. $\frac{x - y}{x + y} + \frac{y}{x}$
32. $\frac{\frac{2}{x}}{\frac{3}{y}}$
33. $\frac{1 + \frac{2}{x}}{4 - \frac{6}{x}}$
34. $\frac{\frac{1}{x - 2}}{2 + \frac{1}{x}}$
35. $\frac{y}{4y + 8} - \frac{1}{y^2 + 2y}$
36. $\frac{1 + \frac{2}{3}}{\frac{4}{9}}$
37. $\frac{6x^2}{3x - 2} + \frac{5x - 6}{3x - 2}$
38. $\frac{\frac{3}{x + 1}}{\frac{5}{x - 1}}$
39. $\frac{\frac{2}{x} + 6}{\frac{1}{y}}$
40. $\frac{2y}{y^2 - 4y - 12} + \frac{y}{y^2 - 10y + 24}$

Practice 9-5 Answers

1. $6x(x + 2)(2x - 3)$ 2. $6(x - 1)(x - 2)^2(x + 10)$
3. $(2x + 3)^2(2x - 3)$ 4. $10x(x + 3)^2(x - 3)$ 5. $\frac{2x^2}{5}$
6. $\frac{x^2 + 2x - 2}{12}$ 7. $\frac{3}{xy^3}$ 8. $\frac{2 - n}{n - 4}$ 9. $-\frac{x}{9}$
10. $\frac{7y + 5}{3y}$ 11. $\frac{3(3y - 1)}{y^2 - 5}$ 12. $\frac{12y + 5x}{10x^2y^2}$
13. $\frac{3 - 2x^2y^2}{8x^3y^3}$ 14. $\frac{10x - 26}{(x + 5)(x - 5)(x + 1)}$
15. $\frac{9y + 4x}{21x^2y^2}$ 16. $\frac{x^2y}{x^2 - 4}$ 17. $\frac{3}{x + 2}$
18. $\frac{(5x + 1)(x + 3)}{(x - 3)(x + 2)(x + 5)(x + 1)}$
19. $\frac{7x + 5}{2(3x - 1)(2x - 3)(2x + 3)}$ 20. $\frac{2(x + 2)}{x(x - 3)}$
21. $\frac{4x + 1}{(x + 5)(x + 1)(x - 2)}$ 22. $\frac{4x^2 - 36x + 3}{x - 9}$
23. $\frac{3x^2 + 14}{x^2 + 5}$ 24. $\frac{5x^2 - 25x + 31}{x^2 - 5x + 6}$ 25. $\frac{5x + 6}{3x - 1}$
26. $\frac{5a^2 + 2a}{a^2 - 4}$ 27. $\frac{8c^2}{c^2 - 9}$ 28. $\frac{2}{gh}$ 29. $-\frac{6t}{t^2 - 25}$
30. $\frac{8r^2}{r^2 - 4}$ 31. $\frac{x^2 + y^2}{x^2 + xy}$ 32. $\frac{2y}{3x}$ 33. $\frac{x + 2}{4x - 6}$
34. $\frac{x}{2x^2 - 3x - 2}$ 35. $\frac{y - 2}{4y}$ 36. $\frac{15}{4}$ 37. $2x + 3$
38. $\frac{3x - 3}{5x + 5}$ 39. $\frac{2y + 6xy}{x}$ 40. $\frac{3y(y - 2)}{(y - 6)(y + 2)(y - 4)}$

Name _____ Class _____ Date _____

Practice 9-6

Solving Rational Equations

Solve each equation. Check each solution.

1. $\frac{1}{x} = \frac{x}{9}$
2. $\frac{4}{x} = \frac{x}{4}$
3. $\frac{3x}{4} = \frac{5x+1}{3}$
4. $-\frac{4}{x+1} = \frac{5}{3x+1}$
5. $\frac{3}{2x-3} = \frac{1}{5-2x}$
6. $\frac{x-4}{3} = \frac{x-2}{2}$
7. $\frac{3}{1-x} = \frac{2}{1+x}$
8. $\frac{2x-3}{4} = \frac{2x-5}{6}$
9. $\frac{1}{x} = \frac{2}{x+3}$
10. $\frac{x-1}{6} = \frac{x}{4}$
11. $\frac{3-x}{6} = \frac{6-x}{12}$
12. $\frac{4}{x+3} = \frac{10}{2x-1}$
13. $\frac{x-2}{10} = \frac{x-7}{5}$
14. $\frac{3}{3-x} = \frac{4}{2-x}$
15. $\frac{1}{4-5x} = \frac{3}{x+9}$
16. $x + \frac{10}{x-2} = \frac{x^2+3x}{x-2}$
17. $\frac{2}{x+3} + \frac{5}{3-x} = \frac{6}{x^2-9}$
18. $\frac{1}{2x+2} + \frac{5}{x^2-1} = \frac{1}{x-1}$
19. $\frac{2}{6x+2} = \frac{x}{3x^2+11}$
20. $\frac{3}{2x-4} = \frac{5}{3x+7}$
21. $\frac{2y}{5} + \frac{2}{6} = \frac{y}{2} - \frac{1}{6}$
22. $\frac{1}{2x+2} = \frac{1}{x-1}$
23. $\frac{2}{x+2} + \frac{5}{x-2} = \frac{6}{x^2-4}$
24. $5 + \frac{5}{x} = \frac{6}{5x}$
25. $\frac{4}{x-1} = \frac{5}{x-2}$
26. $\frac{2x-1}{x+3} = \frac{5}{3}$
27. $\frac{7}{2} = \frac{7x}{8} - 4$
28. $5 - \frac{4}{x+1} = 6$
29. $\frac{x}{x+3} - \frac{x}{x-3} = \frac{x^2+9}{x^2-9}$
30. $\frac{x}{3} + \frac{x}{2} = 10$
31. $\frac{2}{3} + \frac{3x-1}{6} = \frac{5}{2}$
32. $4 + \frac{2y}{y-5} = \frac{8}{y-5}$
33. $\frac{4}{x-3} = \frac{2}{x+1} + \frac{16}{x^2-2x-3}$
34. $\frac{7}{x^2-5x} + \frac{2}{x} = \frac{3}{2x-10}$
35. $\frac{x+3}{x^2+3x-4} = \frac{x+2}{x^2-16}$
36. $\frac{3y}{5} + \frac{1}{2} = \frac{y}{10}$

37. A round trip flight took 3.9 h flying time. The plane traveled the 510 mi to the city at 255 mi/h with no wind. How strong was the wind on the return flight? Was the wind a head wind or a tail wind?

38. A round trip flight took 5 h flying time. The plane traveled the 720 mi to the city at 295 mi/h with no wind. How strong was the wind on the return flight? Was the wind a head wind or a tail wind?

39. If one student can complete the decorations for the prom in 5 days working alone, another student could do it in 3 days, and a third could do it in 4 days, how long would it take them working together?

40. Tom and Huck start a business painting fences. They paint Aunt Polly's fence and find that they can paint a 200-ft^2 fence in 40 min if they work together. If Huck works four times faster than Tom, how long would it take each of them to paint a 500-ft^2 fence working alone?

Practice 9-6 ANSWERS

1. ± 3 **2.** ± 4 **3.** $-\frac{4}{11}$ **4.** $-\frac{9}{17}$ **5.** $\frac{9}{4}$ **6.** -2 **7.** -0.2

8. -0.5 **9.** 3 **10.** -2 **11.** 0 **12.** -17 **13.** 12 **14.** 6

15. $\frac{3}{16}$ **16.** no solution **17.** -9 **18.** 7 **19.** 11 **20.** 41

21. 5 **22.** -3 **23.** 0 **24.** $-\frac{19}{25}$ **25.** -3 **26.** 18 **27.** $\frac{60}{7}$

28. -5 **29.** no solution **30.** 12 **31.** 4 **32.** $\frac{14}{3}$

33. no solution **34.** 6 **35.** -5 **36.** -1

37. about 13 mi/h tail wind **38.** about 14 mi/h head wind

39. about 1.3 days **40.** Tom: 125 min, Huck: 500 min